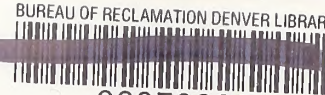


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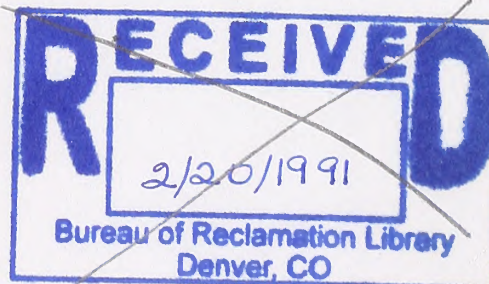
Final Eligibility and Suitability Report for the
Upper Klamath Wild and Scenic River Study

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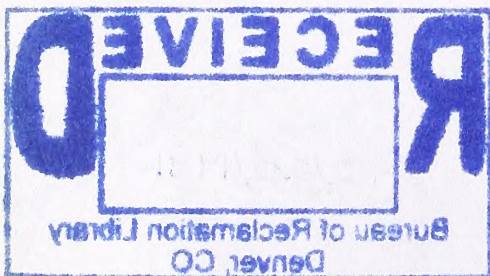
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BIBLIOGRAPHIC INFORMATION

PB90-231630

Report Nos: BLM/OR/PT-90/14/1792

Title: Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study.

Date: Mar 90

Performing Organization: Bureau of Land Management, Klamath Falls, OR. Klamath Falls Resource Area Office.

Supplementary Notes: Also available from Supt. of Docs.

NTIS Field/Group Codes: 48G, 48B

Price: PC All/MF A02

Availability: Available from the National Technical Information Service,
Springfield, VA. 22161

Number of Pages: 226p

Keywords: *Legislation, *Classifications, *Upper Klamath River, Conservation, History, Land use, Recreation, Acceptability, Water flow, Fisheries, Government policies, Management, Wildlife, Esthetics, Public opinion, Maps, Environmental impacts, Oregon, California, *Wild and Scenic Rivers Act of 1968, Habitats, Ownership.

Abstract: The final report evaluates the eligibility, classification, and suitability of the upper Klamath River in southern Oregon and northern California for designation as a component of the National Wild and Scenic Rivers System. The Bureau of Land Management determined segment 1 ineligible and segments 2 and 3 both eligible and suitable for designation with a 'scenic' classification. The report documents those determinations and conclusions on an evaluation of the natural values in the area.



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

PB90-231630

Klamath Falls Resource Area
2795 Anderson Ave., Bldg. 25
Klamath Falls, Oregon 97603

March 1990



Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study



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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

BLM-OR-PT-90-14-1792



**United States Department of the Interior
Bureau of Land Management**

Klamath Falls Resource Area Office
Lakeview District Office
November 1989

TAKE
PRIDE IN
AMERICA

Lakeview District
Klamath Falls Resource Area
2795 Anderson Ave., Bldg. 25
Klamath Falls, OR 97603

Ukiah District
Redding Resource Area
355 Hemsted Dr.
Redding, CA 96002

Dear Concerned Citizen:

April 2, 1990

Enclosed is a copy of the Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study. The study area is located in southern Oregon and northern California and involves the upper Klamath River from the John C. Boyle Dam in Oregon to the backwater of Copco Reservoir in California. The study corridor is 20.5 miles long and 0.5 to 1.5 miles wide.

The purpose of this report is to disclose the findings of the Bureau of Land Management (BLM) on the qualifications of the upper Klamath River as an addition to the National Wild and Scenic Rivers System. The final study report is based on the BLM's draft eligibility and suitability study report published in November 1989 and on the resulting public comments received on the draft until December 31, 1989. Over one thousand comments were received from individuals, groups, and governmental agencies.

The BLM Lakeview District Multiple Use Advisory Council also reviewed the draft study report and held a public meeting to solicit additional views and comments. The Council made two recommendations regarding the BLM study report, which are included in appendix G (Public Involvement).

Differences between the draft and final are based primarily on comments and recommendations received during the public comment period. The final eligibility and suitability report is designed to be an independent document without reference to the draft, except for appendix G.

This eligibility and suitability report was directed under the Oregon Omnibus Rivers Act, which amended section 5(d) of the Wild and Scenic Rivers Act. Specifically, this portion of the Act requires that the BLM: 1) give consideration to potential National wild, scenic and recreation river areas, and 2) complete specific studies and investigations to determine which additional wild, scenic, and recreational river areas shall be evaluated in subsequent planning reports.

This final study report, which has been forwarded to Congress, finds that two sections of the river (16.3 miles) meet the eligibility and suitability requirements; however, the report does not make a recommendation as to whether the river should or should not be included in the National Wild and Scenic Rivers System. The findings will be considered in the BLM's ongoing planning processes in both the Ukiah District, Redding Resource Area and the Lakeview District, Klamath Falls Resource Area.

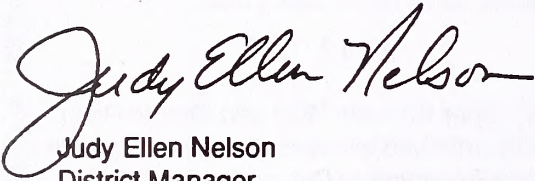
Additional information not considered in this report, such as the economic effects of designation, will be considered by the BLM during its planning process. For those interested in the economics of the area, the economic evaluation in the Federal Energy Regulatory Commission's (FERC) Environmental Impact Statement (EIS) on the proposed Salt Caves hydroelectric project and appendix I in this report, which summarizes existing economic information and studies, are available for review.

This final study report should be reviewed in conjunction with the FERC EIS to get a complete picture of both the resource development and resource protection options. Copies of the FERC EIS may be obtained from: Division of Public Information, Federal Energy Regulatory Commission, 825 N. Capitol St. NE, Washington, DC 20426.

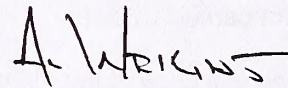
This report considers only the effects that would result from designation under the Wild and Scenic Rivers System as compared to effects that would result from continuing management under existing plans, policies, and laws. Major effects that could be precluded by designation are considered in the Federal Energy Regulatory Commission Environmental Impact Statement (EIS) on the proposed Salt Caves Hydroelectric Project.

Thank you for your continued interest and participation. For additional information or clarification on the Oregon portion of the upper Klamath River please contact Cathy Humphrey at (503) 883-6916, and on the California portion of the upper Klamath River please contact Joe Williams at (916) 246-5325.

Sincerely,



Judy Ellen Nelson
District Manager
Lakeview District



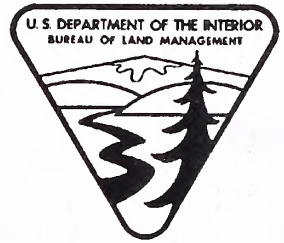
Al Wright
District Manager
Ukiah District



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Klamath Falls Resource Area
2795 Anderson Ave., Bldg. 25
Klamath Falls, Oregon 97603

March 1990



Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study



Table of Contents

Page

EXECUTIVE SUMMARY	i
ACRONYMS	iii

CHAPTER 1: INTRODUCTION

INTRODUCTION	1-2
BACKGROUND	1-3
Projected Key Dates	1-5
ADDITION OF THE CALIFORNIA SEGMENT	1-5
STUDY SEGMENTS AND BOUNDARY	1-5
STUDY PROCESS	1-8
ROLES AND AUTHORITIES IN DESIGNATION PROCESS	1-9
APPLICABLE LAWS AND REGULATIONS	1-9
Klamath River Basin Compact	1-9
Withdrawals and Reservations	1-10
Oregon Scenic Waterways Act	1-11
County Comprehensive Planning	1-14

CHAPTER 2: EXISTING SITUATION

INTRODUCTION	2-2
GENERAL SETTING	2-2
Physiography	2-2
Land Ownership	2-3
Existing Rights	2-3
Socioeconomics	2-3
Regional Transportation	2-6
Access	2-6
LAND USES	2-10
Energy Generation and Transmission	2-10
Recreation	2-10
Wildlife Habitat Management	2-11
Range Resources	2-11
Timber Management	2-15
Native American Traditional Use	2-15
DESCRIPTION OF RESOURCES	2-16
Recreation	2-16
Wildlife	2-23
Fish	2-29
Cultural	2-30
Scenic	2-33
Vegetation	2-37
Water	2-38
Geology	2-43

CHAPTER 3: ELIGIBILITY DETERMINATION

INTRODUCTION	3-2
FREE-FLOWING	3-2
OUTSTANDINGLY REMARKABLE VALUES	3-3
Recreation Resources	3-4
Wildlife	3-7

Fish	3-9
Prehistoric Resources	3-9
Historic Resources	3-10
Scenic Resources	3-12
Geologic Resources	3-13
Other Similar Values	3-13

CHAPTER 4: CLASSIFICATION

INTRODUCTION	4-2
CLASSIFICATION CATEGORIES	4-2
CLASSIFICATION CRITERIA	4-2
CLASSIFICATION DETERMINATION	4-2
Segment 1	4-4
Segment 2	4-4
Segment 3	4-7

CHAPTER 5: SUITABILITY

INTRODUCTION	5-2
EXISTING SITUATION	5-2
Land Ownership and Use	5-2
Historical and Existing Rights	5-3
Administering Agency and Authorities	5-3
Resource Classifications	5-8
Characteristics Which Do or Do Not Make The Area a Worthy Addition to the System	5-8
Summary	5-10
ALTERNATIVE MANAGEMENT STRATEGIES	5-10
Management Objectives Common to all Strategies	5-10
Strategy 1 - Current Management	5-16
Strategy 2 - Current Management Intensified	5-16
Strategy 3 - Wild and Scenic Designation	5-16
Summary Comparison of Alternative Management Strategies	5-17
REASONABLY FORESEEABLE POTENTIAL IMPACTS	5-18
Land Ownership and Management	5-18
Land Uses	5-23
Outstandingly Remarkable Values	5-24
Water Issues	5-25
Summary	5-27
CONCLUSION	5-27

CHAPTER 6: CONSULTATION AND COORDINATION

Preparers and Reviewers	6-2
Agencies and Organizations Contacted or Consulted	6-3
Businesses, organizations, and agencies to whom copies of the Draft Eligibility and Suitability Report for the upper Klamath Wild and Scenic River Study were sent	6-3
Individuals, businesses, organizations, and agencies who submitted comments on the draft river study	6-5

GLOSSARY	6-17
REFERENCES	6-21

Appendix A: RECREATION OPPORTUNITY SPECTRUM (ROS) CLASSES	A-1
Appendix B: SPECIES LIST FOR BIRDS, MAMMALS, AND HERPTILES	B-1
Appendix C: SPECIES LIST FOR FISH	C-1
Appendix D: PREHISTORIC SITES IN THE UPPER KLAMATH RIVER STUDY	D-1
Appendix E: SPECIES LIST FOR PLANTS	E-1
Appendix F: STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN REGION 9	F-1
Appendix G: PUBLIC INVOLVEMENT	G-1
Appendix H: A COMPARISON OF MANAGEMENT GUIDELINES FOR FEDERAL WILD AND SCENIC RIVERS AND STATE SCENIC WATERWAYS	H-1
Appendix I: INVENTORY OF ECONOMIC STUDIES	I-1

MAPS

Map 1-1: Upper Klamath River	1-3
Map 1-2: Wild and Scenic River Study Area	1-6
Map 1-3: Power Withdrawals	1-12
Map 2-1: Land Ownership	2-4
Map 2-2: Regional Transportation and Major Population Centers	2-7
Map 2-3: Access Roads and Recreation Sites	2-8
Map 2-4: Grazing Allotments and Wild Horse Management Area	2-12
Map 2-5: Critical Deer Winter Range and Falcon Habitat	2-26
Map 2-6: Historic Sites	2-34

TABLES:

Table 1-1: Federal Power Withdrawals in the Upper Klamath River Study Area	1-11
Table 2-1: Upper Klamath River Study Area Land Ownership	2-3
Table 2-2: Upper Klamath River Study Area Rights-of-Way	2-6
Table 2-3: Grazing Leases and Season of Use Within the Study Area	2-14
Table 2-4: Whitewater Boating Rivers in Oregon and Northern California	2-18
Table 2-5: Whitewater Classification on the Upper Klamath River	2-19
Table 2-6: Upper Klamath River Use Statistics for Whitewater Rafting	2-22
Table 2-7: Mean Discharges and Percent Annual Runoff, Klamath River	2-40
Table 2-8: Mean and Range Values for Observed Water Quality Parameters, Mainstem Klamath River	2-41
Table 2-9: Klamath River Water Quality Parameters(Median Values) During Critical Period, June-October, 1977-1987	2-43
Table 3-1: Summary of Outstandingly Remarkable Resources in the Upper Klamath River Study Area	3-5
Table 3-2: Threatened, Endangered, and State Sensitive Fish and Wildlife Found Within the Study Area	3-8
Table 4-1: Classification Criteria for Wild, Scenic, and Recreational Rivers	4-3
Table 4-2: Upper Klamath River Classification Summary	4-6
Table 5-1: Federal, State, and Local Plans and Legislation and Their Relation to Suitability	5-4
Table 5-2: Existing Resource Classifications on the Upper Klamath River	5-9
Table 5-3: State Restrictions on Land Uses and Activities in the Klamath Scenic Waterway	5-11
Table 5-4: Alternative Management Strategies for Wild and Scenic Values	5-12
Table 5-5: Summary of Reasonably Foreseeable Potential Effects of Management Strategies	5-19

Executive Summary

This final report evaluates the eligibility, classification, and suitability of the upper Klamath River in southern Oregon and northern California for designation as a component of the National Wild and Scenic Rivers System (NWSRS). The Bureau of Land Management (BLM) determined segment 1 ineligible and segments 2 and 3 both eligible and suitable for designation with a "scenic" classification. This report documents those determinations and conclusions on an evaluation of the natural values in the area.

Concurrent with this study process, the Federal Energy Regulatory Commission (FERC) is considering a license application submitted by the City of Klamath Falls for development of the Salt Caves hydroelectric project on the upper Klamath River. The BLM study does not evaluate either the Salt Caves proposal or the economic feasibility or effects associated with it. Those analyses are included in the FERC Environmental Impact Statement on the proposed Salt Caves hydroelectric project.

The study portion of the river was divided into three segments. Segment 1 begins just below the J.C. Boyle Dam and ends at the J.C. Boyle Powerhouse (river mile (RM) 224.5 to 220.3). Segment 2 begins at the powerhouse and ends at the Oregon-California state line (RM 220.3 to 209.3). In June 1989, a 5.3-mile segment in California (from the state line to the slackwater of Copco Reservoir, RM 209.3 to 204), was included in the study as segment 3. If Congress considers the upper Klamath River for designation, segment 3 may either be included in the decision or considered after the Bureau of Land Management's Redding, California planning process is completed. If a determination is not made on the portion of the river in Oregon, it will also be carried through the planning process in the Klamath Falls, Oregon BLM office.

Segment 1 was determined ineligible and segments 2 and 3 were determined eligible for inclusion in the National system. Because of significant modification of the waterway and major continuous diversion, segment 1 does not meet the definition of "free-flowing" and consequently does not meet the eligibility criteria. Water flows in segments 2 and 3 fluctuate daily and seasonally, but the original river volume returns to the natural river bed; thereby, fitting the "free-flowing" definition. Recreation, fish, wildlife, historic, prehistoric, and scenic resource values, and Native American traditional use of the Klamath River Canyon are considered outstandingly remarkable in segment 2. In segment 3, the outstandingly remarkable values are recreation, fish, wildlife, historic, and scenic resources.

Both segments 2 and 3 meet or exceed the criteria for a scenic classification, but do not meet the criteria for wild classification.

Segments 2 and 3 were determined suitable based on the existing situation, analysis of three alternative management strategies, and the reasonably foreseeable potential effects of designation. The existing situation of the upper Klamath River corridor is discussed as it pertains to the suitability of the river for inclusion in the NWSRS. Current land ownership, uses, administration, administering authorities, resource classifications, and resource values are consistent with or enhance the river's suitability. Federal power withdrawals and existing rights have no effect on suitability. Maintenance of existing hydroelectric facilities would be permitted, provided the area remained natural in appearance and harmonized with the surrounding environment.

Three alternative strategies for management of the wild & scenic values in the Klamath River Canyon were developed and the potential consequences of the strategies were analyzed. Under all management strategies, the Oregon State Parks and Recreation Department would review new land uses, activities, and developments within the Klamath Scenic Waterway (segment 2) under the Oregon State Scenic Waterways Act prior to commencement of the proposed action.

Strategy 1, a continuation of existing management, would provide relatively short-term protection of outstandingly remarkable and significant values and would allow the greatest amount of land uses, activities, and developments. Strategy 2, a continuation of existing management with additional administrative protections, would provide more assured, but not necessarily longer term, protection to outstandingly remarkable and significant values, than continuation of existing management. Certain land uses, activities, and developments could be restricted under strategy 2. Segment 2 could be designated an Area of Critical Environmental Concern by the BLM through its planning process. Strategy 3 would include Congressional designation of eligible and suitable river segments and would assure long-term protection of resource values under the authority of the Wild and Scenic Rivers Act of 1968. Under this strategy, a wide range of management opportunities, which would be defined during formulation of a management plan, would be available. The BLM would seek cooperative agreements, easements, land exchanges, and jurisdictional transfers to facilitate consistent resource management on public and private land. Strategy 3 could be the most costly; would provide the best long-term protection of resources on a larger, more contiguous area in the canyon; and could be the most restrictive on many new, and some existing, land uses, activities, and developments on public land.

If the upper Klamath River were designated, certain reasonably foreseeable potential uses of the land and related waters could be affected. Designation would have no foreseeable effect on private land. Private

land uses and developments in segment 2 would be affected more by the State Scenic Waterways Act than by the Federal Wild and Scenic Rivers Act. Management of public land would be more consistent under Federal designation. Existing land uses and activities, such as agriculture and grazing, timber harvest, and mineral activity, would incur little or no effect. New land uses, activities, and developments would not be affected unless that potential land use or development was a threat to any outstandingly remarkable value. Under the State Scenic Waterways Act, future dams, reservoirs, impoundments and placer mining are prohibited in segment 2. Federal management would be consistent with State law to the greatest extent practicable; therefore, federal designation would have little or no further effect. The Wild and Scenic Rivers Act restricts development of hydroelectric power facilities, dams, and major diversions in designated segments. Protection of the outstandingly remarkable values in the eligible segments would be enhanced by designation.

Although all potentially affected parties do not agree, the BLM, based on available information, believes that there would be no significant conflicts between management of the upper Klamath River in the study area under the Wild and Scenic Rivers Act and the Klamath River Basin Compact. The BLM recognizes that designation may have some effect on future water right applications if the proposed use of the water would have an adverse effect on the outstandingly remarkable values in the designated segment. Future water appropriations, including offstream storage, could be allowed on a designated river to the extent they are consistent with State law, the Compact and Section 13 of the Wild and Scenic Rivers Act. Because of the highly speculative nature of future applications and resulting effects, if any, no related analysis is made in this study.

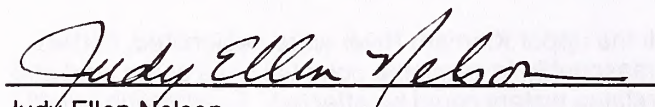
Based on the resource values in the canyon, criteria provided in the Wild and Scenic Rivers Act, analysis of management strategies, and the reasonably foreseeable potential effects of designation, this study concludes that segments 2 and 3 of the upper Klamath River are eligible and suitable for inclusion in, and manageable under, the National Wild & Scenic Rivers System. Other alternatives could protect the outstandingly remarkable values in the Klamath River Canyon; however, because these protections result from administrative designations, they could be enhanced or diminished through the BLM land use planning process or other existing legal authorities.

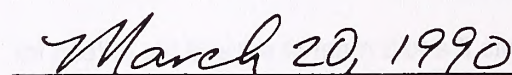
Although this report contains findings on the eligibility, highest classification, and suitability of the upper Klamath River for designation under the Wild &

Scenic Rivers Act, there should be no inference drawn that the BLM is making a recommendation at this time as to whether the Congress should or should not designate the upper Klamath River.

The final eligibility and suitability report is designed to stand as an independent document without reference to the draft eligibility and suitability report, published in November 1989. The Comment Analysis section in the Public Involvement appendix highlights many of the differences between the draft and final study reports. In brief, the major changes from the draft report are as follows:

- a) The boundary between segments 1 and 2 was changed by 0.8 mile. Segment 1 now ends at the J.C. Boyle Powerhouse, not 0.8 mile below it. The length of segment 2 is now equivalent to the Klamath State Scenic Waterway.
- b) Recreational fishing and Native American traditional use of the canyon were added as outstandingly remarkable values based on information received during the public comment period.
- c) Chapters 5 and 6 (from the draft study report) were combined into one chapter, which is Chapter 5—Suitability. This chapter was also expanded to include a description of whether existing conditions would be compatible with designation of the river for inclusion in the National Wild and Scenic Rivers System and whether land ownership and management, land uses, outstandingly remarkable values, and water issues would be affected by a designation. The alternative management strategies from the draft report's chapter 5 are also discussed in the final report's suitability determination.
- d) A list of those who commented on the draft eligibility and suitability report was added to chapter 6.
- e) Three appendices were added: 1) Appendix G—Public Involvement, including a summary of the comments and the BLM response and the recommendations made by the BLM's Lakeview District Multiple Use Advisory Council; 2) Appendix H—A Comparison of Management Guidelines for Federal Wild and Scenic Rivers and State Scenic Waterways; and 3) Appendix I—Inventory of Economic Studies


Judy Ellen Nelson
District Manager
BLM, Lakeview District


Date

Acronyms

ACEC	Area of Critical Environmental Concern
AUM	Animal Unit Month
BLM	Bureau of Land Management
BOD	Biochemical Oxygen Demand
cfs	Cubic Feet per Second
DEQ	Department of Environmental Quality
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act of 1976
MFP	Management Framework Plan
NWSRS	National Wild and Scenic Rivers System
O&C	Oregon and California Act of 1937 (Revested Oregon and California O&C Railroad and Reconveyed Coos Bay Wagon Road Grant Lands).
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ORS	Oregon Revised Statutes
PL	Public Law
PP&L	Pacific Power and Light Company
RM	River Mile
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
RRA	Redding Resource Area
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SRMA	Special Recreation Management Area
T&E	Threatened, Endangered, and/or State Sensitive
TMDL	Total Maximum Daily Load
USC	United States Code
USDI	United States Department of the Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRM	Visual Resource Management
VUD	Visitor Use Day
WHMA	Wild Horse Management Area

Chapter 1 – Introduction



Lower end of Frain Ranch and beginning of Caldera Rapid.

Introduction

The Klamath River begins in Lake Ewauna, just south of the city of Klamath Falls, Oregon (map 1-1). It flows southwesterly into California and then west to the Pacific Ocean. From the river's beginning to Copco Lake in California, it is known as the upper Klamath River. From Copco Lake to the Pacific Ocean, it is the lower Klamath River. The purpose of this eligibility and suitability study is to determine if the upper Klamath River is eligible for inclusion in the National Wild and Scenic Rivers System (NWSRS) and if eligible, to determine if it is suitable for inclusion, based on the criteria set forth in the Wild and Scenic Rivers Act of 1968.

Chapter 1 discusses the legislative history of the upper Klamath River, study boundary (including the addition of the California segment), study process, roles and authority, and land and water use allocations. The remainder of this report describes the existing situation, including a description of land uses and resources; eligibility; classification (wild, scenic, or recreational); and suitability with conclusions.

The purpose of the Wild and Scenic Rivers Act of 1968 (Public Law 90-542, October 2, 1968), as stated in section 1(b), is:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

This study report on the upper Klamath River was prepared in accordance with section 5(d) of the Wild and Scenic Rivers Act of 1968, which was amended

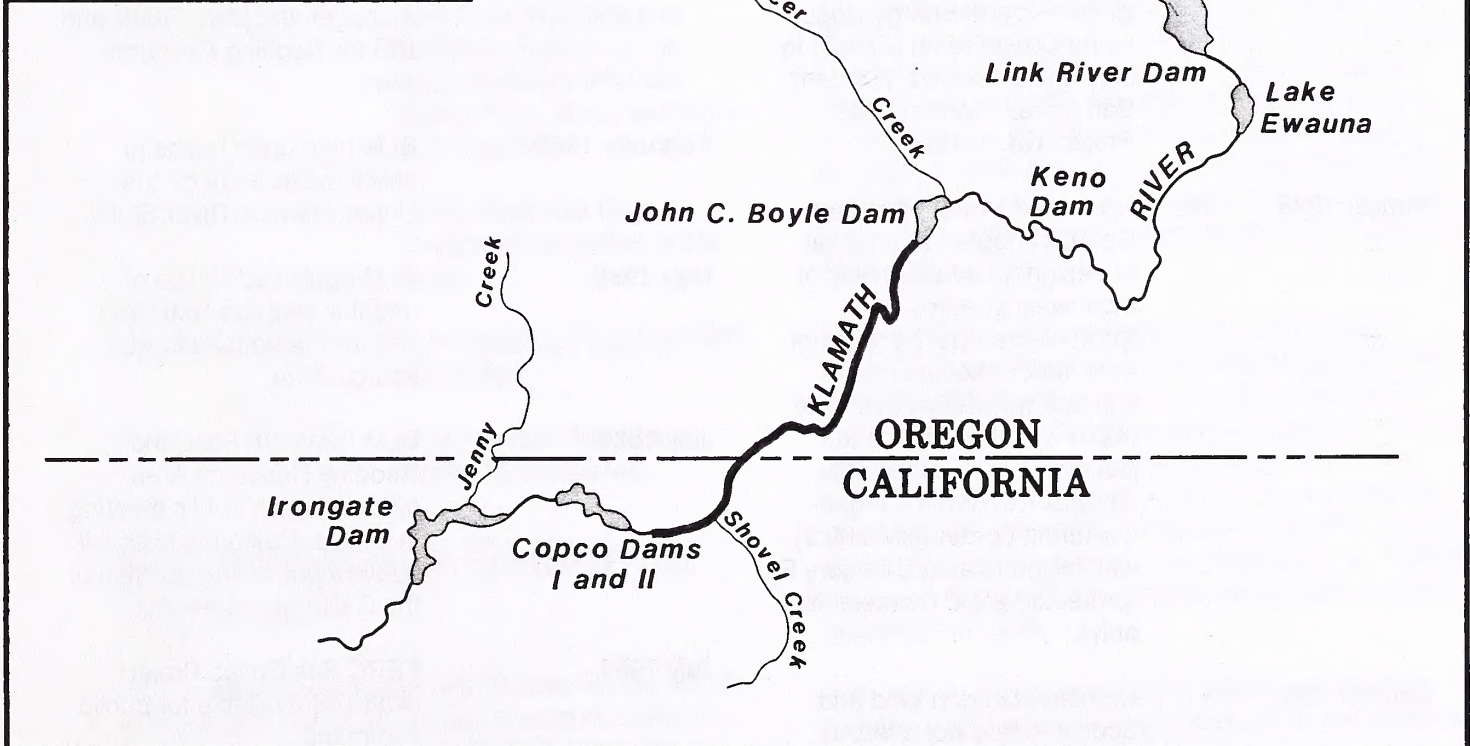
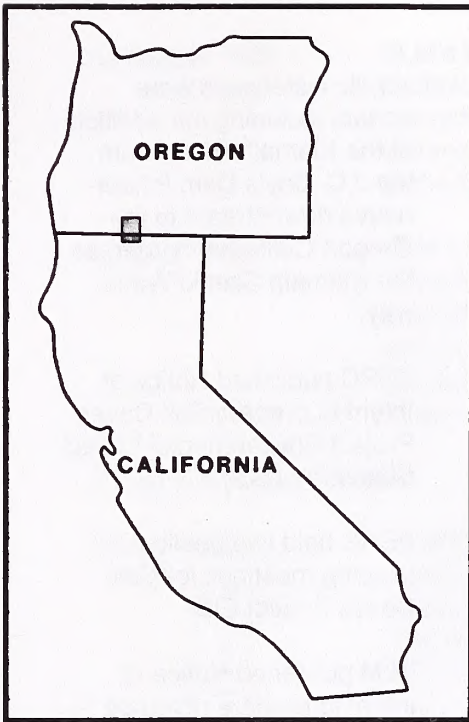
by section 104 of the Omnibus Oregon Wild and Scenic Rivers Act of 1988 (P.L. 100-557, October 28, 1988):

UPPER KLAMATH, OREGON.—The Congress finds that the Secretary of the Interior, in preparing the Nationwide Rivers Inventory as a specific study for possible additions to the National Wild and Scenic Rivers System, identified the upper Klamath River from below the John C. Boyle Dam to the Oregon-California state line. The Secretary, acting through the Bureau of Land Management, is authorized under this subsection to complete a study of the eligibility and suitability of such segment for potential addition to the National Wild and Scenic Rivers System. Such study shall be completed, and a report containing the results of the study shall be submitted to Congress by April 1, 1990. Nothing in this paragraph shall affect the authority or responsibilities of any other Federal agency with respect to activities or actions on this segment and its immediate environment.

Background

Several events have occurred that are related to management of the upper Klamath River. They include:

August 1937	Oregon & California Sustained Yield Act effective.
September 1957	Klamath River Basin Compact effective.
October 1968	Wild and Scenic Rivers Act effective.
December 1969	Oregon State Scenic Waterways Act effective (an Oregon law enacting a state protection program for certain rivers throughout Oregon).
October 1976	Federal Land Policy and Management Act effective (establishing public land policy, and providing for the management, protection, development, and enhancement of public lands).
September 1980	Jackson-Klamath Management Framework Plan completed by the Medford District Bureau of Land Management (BLM) office.

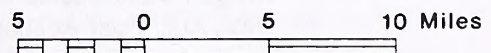


MAP 1-1

UPPER KLAMATH RIVER



March 1990



January 1982	Nationwide Rivers Inventory, a listing of the Nation's significant free-flowing streams, completed by the National Park Service. The Klamath River, from the southern project boundary of J.C. Boyle Dam downstream to the head of Copco Reservoir, was included in the inventory.		scenic waterways were added, including the addition of the Klamath River, from the J.C. Boyle Dam powerhouse downstream to the Oregon-California border, as the Klamath Scenic Waterway.
March 1983	BLM Recreation Area Management Plan approved for the Klamath River Special Recreation Management Area.	November 1988	FERC published Notice of Intent to prepare Salt Caves Project Environmental Impact Statement (EIS).
July 1986	City of Klamath Falls submitted an application for license to the Federal Energy Regulatory Commission (FERC) to build the proposed "low dam" Salt Caves Hydroelectric Project No. 10199.	December 1988	FERC held two public scoping meetings for Salt Caves Project EIS.
August 1988	Northwest Power Planning Council adopted a proposal to designate 44,000 miles of Northwest streams as "protected areas" because of their importance as critical fish and wildlife habitat. The upper Klamath River from Spencer Creek (River Mile (RM) 227.5) to the Oregon-California border (RM 209.2) was included as a Category F "protected area" (resident fish only).	January 1989	BLM published Notice of Intent to prepare resource management plan (RMP) and EIS for Redding Resource Area.
		February 1989	BLM held open house to solicit public input on the Upper Klamath River Study.
		May 1989	BLM published Notice of Intent to prepare RMP and EIS for Klamath Falls Resource Area.
		July 1989	BLM (Klamath Falls and Redding Resource Area offices) held a public meeting in Copco, California to solicit public input on the addition of the California segment.
October 1988	Omnibus Oregon Wild and Scenic Rivers Act effective requiring Department of Interior to study the eligibility and suitability of the upper Klamath River by April 1, 1990 for inclusion into the National Wild and Scenic Rivers System.	July 1989	FERC Salt Caves Project Draft EIS available for public comment.
		November 1989	BLM Draft Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study available for public comment.
November 1988	Ballot Measure 7 passed by statewide vote, amending the Oregon State Scenic Waterways Act. Four existing scenic waterways were expanded and seven new	December 1989	BLM held an open house to solicit public input on the Draft Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study.

December 1989	BLM's Lakeview District Multiple Use Advisory Council met to hear public comments on the adequacy of the BLM draft study report.
January 1990	BLM's Lakeview District Multiple Use Advisory Council met to make recommendations on the adequacy of the BLM draft study report.

Projected Key Dates

March 1990	BLM Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study submitted to Congress.
March 1990	BLM Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study available to the public.
May 1990	FERC Final Salt Caves Project EIS available to the public.
June 1991	BLM Redding Final RMP/EIS completed.
Fall 1992	BLM Klamath Falls Final RMP/EIS completed.

Addition of the California Segment

The Omnibus Oregon Wild and Scenic Rivers Act of 1988 requires the BLM to study the upper Klamath River from below the John C. Boyle Dam to the Oregon-California border. The scope of this study, however, was later expanded to include an assessment of the segment of river from the Oregon-California border to the backwater of Copco Reservoir in California (RM 204). This was done for the following reasons: 1) public comments stated that the river's resource values do not stop at the border but rather continue to Copco Reservoir; 2) the segment of the upper Klamath River that is listed in the National Park Service's Nationwide Rivers Inventory (a list of potential wild, scenic, or recreational rivers published in 1982) includes the California segment; and 3) the BLM in Redding, California is in the preliminary stages

of completing an RMP, and consideration must be given to potential national wild, scenic, and recreational river areas (section 5(d) of the Wild and Scenic Rivers Act of 1968) during the RMP process. To avoid duplication of effort, it was agreed the BLM in Klamath Falls would include the California segment in its study of the upper Klamath River, and this study would be used as appropriate in the BLM Redding RMP.

Congress will make the determination on whether river segments are to be included in the NWSRS. The California segment may either be designated by Congress with the rest of the upper Klamath River or recommended by the BLM for designation or non-designation as part of the Redding RMP process.

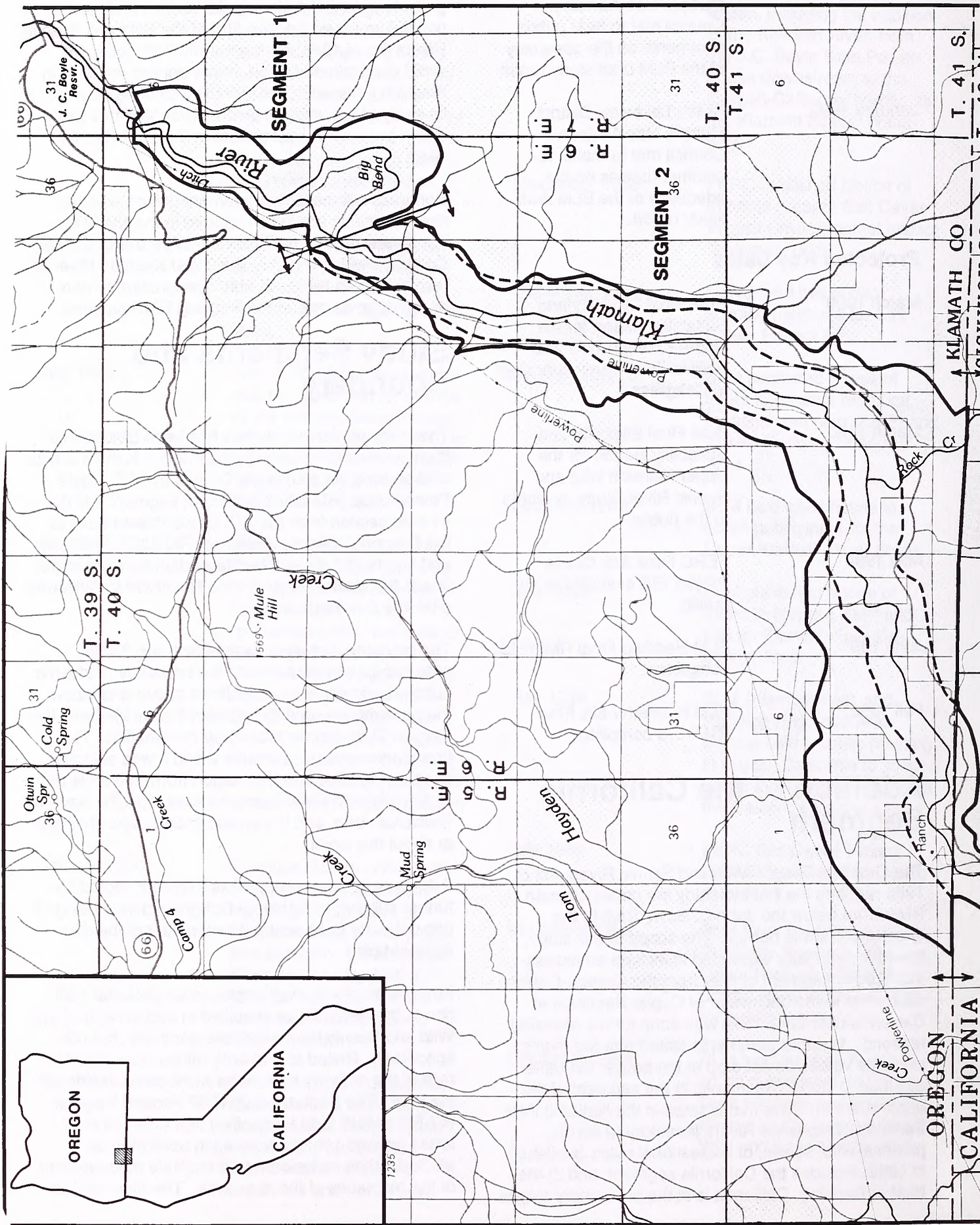
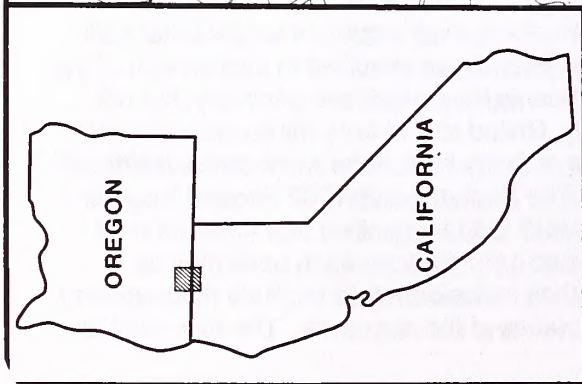
Study Segments and Boundary

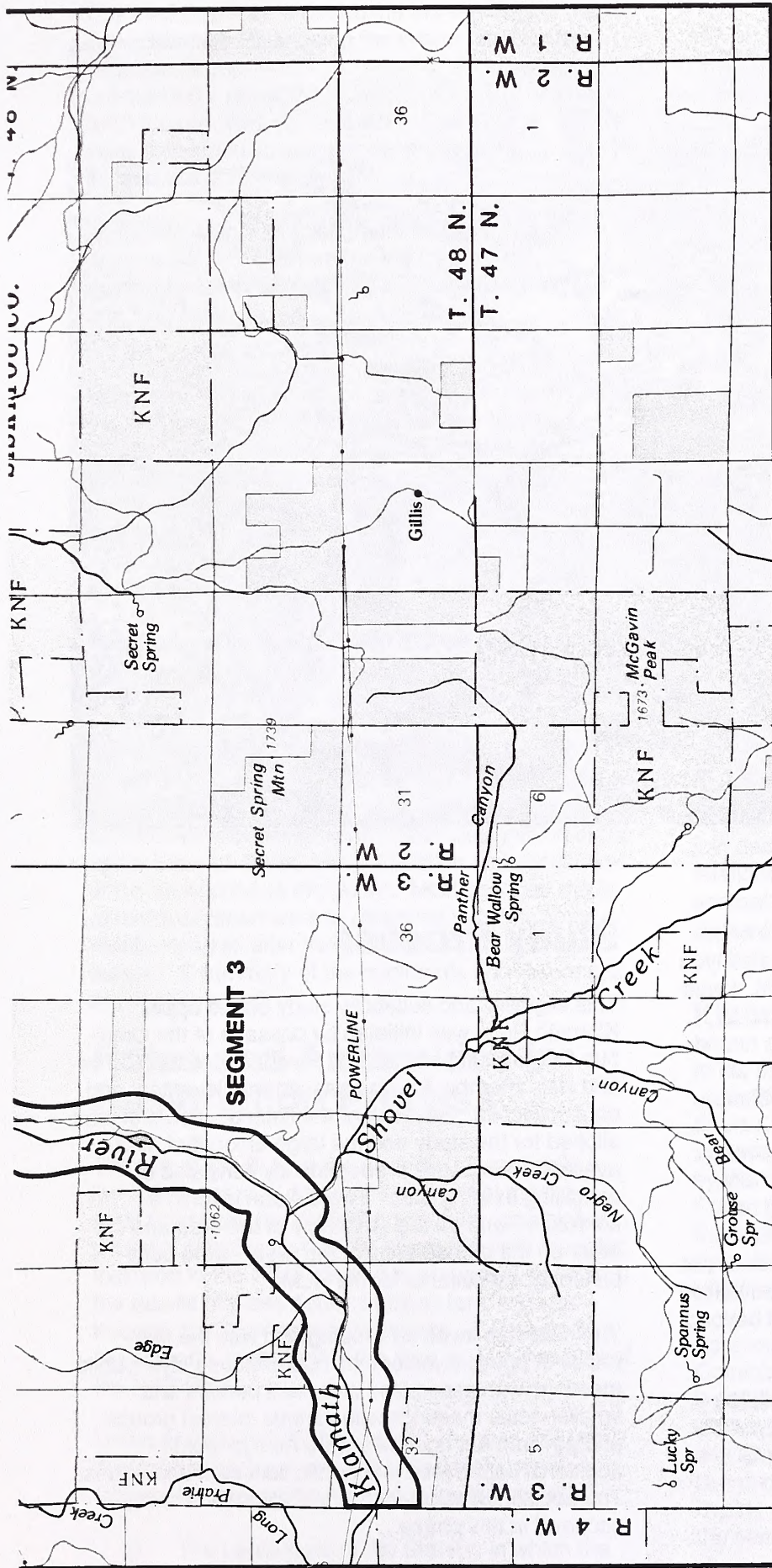
The study portion of the river has been divided into three segments (map 1-2). Segment 1 is the 4.2-mile section from the J.C. Boyle Dam to the J.C. Boyle Powerhouse (RM 224.5 to 220.3); segment 2 is the 11-mile section from the J.C. Boyle Powerhouse to the Oregon-California state line (RM 220.3 to 209.3); and segment 3 is the 5.3-mile section from the state line to the slackwater of Copco Reservoir in California (RM 209.3 to 204).

The boundary between segments 1 and 2 was selected for two reasons. 1) the boundary marks the substantially different water flows above and below the powerhouse; and 2) segment 2 coincides with the Oregon State Scenic Waterway designation. The boundary between segments 2 and 3 was selected because that line divides Oregon from California and BLM's Klamath Falls Resource Area from the Redding Resource Area, and the physical landscape changes at about that point.

If the river is designated, these segments could be further subdivided either by Congress during designation or by the BLM during development of the management plan.

Boundaries of any river proposed for potential addition to the NWSRS, as specified in section 4(d) of the Wild and Scenic Rivers Act, are generally, but not specifically, limited to that area measured within 1/4-mile of the ordinary high water mark on each side of the river. The September 7, 1982 Federal Register (47 FR 39456) further specifies that adjacent river areas beyond 1/4-mile from each bank may be studied if their inclusion would facilitate management of the resources of the river area. The river-related





LEGEND

— Study Area Boundary

--- Oregon State Scenic Waterway

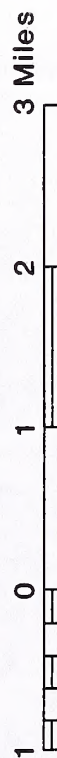


MAP 1-2

UPPER KLAMATH RIVER

WILD AND SCENIC RIVER STUDY AREA

March 1990





The canyon opens up in the California Segment.

resources were assessed both within 1/4-mile of the ordinary high water mark and within the entire canyon from rim-to-rim. Based on these assessments, it was decided that the study area for segments 1 and 2 would include either the rim-to-rim or 1/4-mile boundary, whichever is larger, to effectively evaluate all river-related resources in the canyon's ecosystem.

The boundary in the California segment is 1/4-mile from the ordinary high water mark for the following reasons: 1) the river-related resources would be adequately protected with the 1/4-mile boundary; 2) the canyon widens in California so the rim does not make a suitable boundary; and 3) the BLM has limited authority on private land and most of the land beyond 1/4-mile is privately owned.

The study area encompasses approximately 8,030 acres in Oregon and 1,810 acres in California, of which approximately 5,950 and 200 acres are BLM-administered, respectively.

Study Process

This eligibility and suitability study on the upper Klamath River was initiated by passage of the Omnibus Oregon Wild and Scenic Rivers Act of 1988. The first step after the Act was passed was inventory and data collection. Because of the limited amount of time allotted for the study and the large amount of data available, this phase predominantly consisted of compiling existing data. Two cultural inventory contracts—one on the ethnology of the area and the other on the archaeology of the area—were completed by consultants for the BLM.

The next step involved scoping and was the first phase of public involvement. Open-house style public meetings with associated comment periods and smaller-scale meetings with various interest groups and government agencies were held to identify additional data bases and public concerns and issues. The addition of segment 3 (the California section) occurred in this phase.

The third step was to determine the eligibility of the upper Klamath River using the criteria listed in the Wild and Scenic Rivers Act and the standards for outstandingly remarkable values listed in BLM Instruction Memorandum (OR-89-632). The BLM standards were developed for use throughout western Oregon in its land use planning process.

The fourth step was to segment the river into appropriate units and to determine the classification of these segments, again using the criteria in the Wild and Scenic Rivers Act.

The fifth step was to determine whether or not the upper Klamath River would be suitable for inclusion in the NWSRS using guidance in the Wild and Scenic Rivers Act and BLM instruction memorandum OR-88-670. The consultants' cultural reports were reviewed by BLM staff specialists at the District and State Office level for accuracy and objectivity. Appropriate sections of the reports were incorporated into the BLM study.

The sixth step was publication of a draft eligibility and suitability report in November 1989 with subsequent peer and public review and comment.

The final step includes revision of the study report based on public comment, submission of the final eligibility and suitability report to Congress for its consideration of designation or non-designation of the upper Klamath River, and publication and distribution of the final report to the public. Most changes made to this final report were in response to public comments received after the draft river study was released. A summary of the comments and responses are in appendix G.

Roles and Authorities in Designation Process

The role of the BLM in the eligibility and suitability study process is to determine a potential management boundary, the eligibility, suitability, and highest potential classification of the upper Klamath River for inclusion to the NWSRS; and to prepare a report with the results of these determinations for Congress through the Secretary of the Interior. Congress has the authority to designate the river as a component of the NWSRS.

Under section 2(a)(ii) the State(s) can also request designation of the river, by the Secretary of the Interior, in accordance with the following criteria:

- 1) The Legislature of the State(s) in which the river flows must pass an Act and the

Governor(s) must submit to the Secretary of the Interior an application for acceptance of the river into the NWSRS.

- 2) The Secretary of the Interior must determine that the river meets the criteria established in the Wild and Scenic Rivers Act.
- 3) The State(s) must agree to administer the river as wild, scenic, or recreational with no additional expense to the Federal Government.

The Secretary of the Interior then has the authority to make the designation.

If Congress does not make a decision on any eligible portion of the river based on this study, the BLM will develop appropriate recommendations for Congress during its land use planning process. Consideration of potential wild, scenic, or recreational rivers through the planning process is required under section 5(d) of the Wild and Scenic Rivers Act.

Applicable Laws and Regulations

If the upper Klamath River is designated by Congress as a wild, scenic, or recreational river, determinations and decisions may have to be made regarding the relationship between designation(s) and the existing applicable laws and regulations. Some of these key laws and regulations are briefly described in this section.

Klamath River Basin Compact

In the early 1950's concern for future uses of the upper Klamath Basin waters was initiated by a plan to divert Klamath River water into California's Pit River system and by a proposal for a hydroelectric project by the California-Oregon Power Company, known as Copco (now Pacific Power and Light Company). Both States became concerned that a water right for hydroelectric power would preclude domestic and irrigation water use during periods of water shortage.

As a result, the Oregon and California Klamath River Commissions were created by their respective State legislatures under a statute in 1953. Each Commission was to negotiate with the other to produce an acceptable interstate compact to govern the distribution and use of the waters of the upper Klamath River Basin. Establishment of the Commissions addressed the need to have an agreed upon priority system for

the distribution of water during water shortages to prevent critical needs, such as irrigation, from going unfulfilled.

The two State Commissions then conducted a joint study which, with two other studies by the Oregon Commission and the Bureau of Reclamation, was used as a basis for the Commissions' negotiation of the Klamath River Basin Compact. The Compact became effective in 1957. As discussed in chapter 5, Congress has statutorily provided for the integration of wild and scenic river designation with existing State water laws and interstate compacts.

Section 13(e) of the Wild and Scenic Rivers Act addresses the relationship between interstate compacts and designation.

Nothing contained in this Act shall be construed to alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by any States which contain any portion of the national wild and scenic rivers system.

Withdrawals and Reservations

Withdrawals are areas of federal land that are withheld from settlement, sale, mineral location, or entry under some or all of the general land laws. Their purpose is to limit activities under those laws to maintain other public values in the area or reserve the area for a particular public purpose or program.

A reservation, as defined in section 3(2) of the Federal Power Act of June 10, 1920, as amended (16 U.S.C. 796), is similar to a withdrawal. Reservations are lands and interests in lands owned by the United States that are withdrawn, reserved, or withheld from private appropriation and disposal under the public-land laws; also lands and interests in lands acquired and held for any public purpose. Lands specified in the Oregon and California Sustained Yield Act of 1937 are considered reservations.

Federal Water Power Withdrawals. Federal water power withdrawals have been established under various authorities. Within the study area, power site classifications were created under the Act of March 3, 1879 (20 Stat. 394); power site reserves were created under the Act of June 25, 1910 (36 Stat. 847; 37 Stat. 497); water power designations were created under the Act of June 9, 1916 (39 Stat. 218); and power project withdrawals are created automatically under the authority of the Federal Power Act upon the filing of an application for hydroelectric power development

with the Federal Energy Regulatory Commission (commission), formerly the Federal Power Commission. Section 24 of the Federal Power Act states:

That any lands of the United States included in any proposed project under the provisions of this Act shall from the date of filing of application therefor be reserved from entry, location, or other disposal under the laws of the United States until otherwise directed by the commission or by Congress. * * * Whenever the commission shall determine that the value of any lands of the United States so applied for, or heretofore or hereafter reserved or classified as power sites, will not be injured or destroyed for the purposes of power development by location, entry, or selection under the public-land laws, the Secretary of the Interior, upon notice of such determination, shall declare such lands open to location, entry, or selection, subject to and with a reservation of the right of the United States or its permittees or licensees to enter upon, occupy, and use any part or all of said lands necessary, in the judgment of the commission, for the purposes of this Act, which right shall be expressly reserved in every patent issued for such lands; and no claim or right to compensation shall accrue from the occupation or use of any of said lands for said purposes.

Federal water power withdrawals do not necessarily preclude designation of a river to the NWSRS. For instance, the Kings River in California, added to the NWSRS in 1987, is totally under federal power withdrawals.

Several power withdrawals in the study area overlap (map 1-3) with 99.7 percent of Federal land in segment 1 under power withdrawals, 92 percent in segment 2, and 76 percent in segment 3. These withdrawals and their acreages are listed in table 1-1. No withdrawals, other than for power, exist within the study area boundaries.

Oregon and California Lands. In 1866, Congress granted all odd-numbered sections in a 40-mile strip west of the Cascade Range—from Portland to the California border—to the Oregon and California Railroad Company (3.73 million acres), with the intent that they dispose of the grant lands to speed settlement of the West. In 1916, Congress revested the "Oregon and California" (O&C) lands to the Federal Government (2.89 million acres) and in 1937 the O&C

Table 1-1. Federal Power Withdrawals in the Upper Klamath River Study Area

Power Site Reserve No. 258	Executive Order of 04/13/12	1,586 acres
Power Site Reserve No. 582	Executive Order of 01/19/17	3,671 acres
Water Power Designation No. 3	Secretarial Order of 01/19/17	3,671 acres
Power Site Reserve No. 579	Executive Order of 02/01/17	314 acres
Power Site Classification No. 2	Secretarial Order of 05/19/21	6 acres
Power Project No. 10199	45 FR 80871 (Salt Caves Project)	1,122 acres

Sustained Yield Act was passed, placing these lands under permanent forest management on a sustained yield basis.

The O&C Sustained Yield Act, 43 U.S.C. 1181a, states:

Notwithstanding prior acts, the O&C lands which have heretofore or may hereafter be classified as timberlands, and power-site lands valuable for timber, shall be managed, except as provided in section 1181c of this title, for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities: Provided, that nothing in this section shall be construed to interfere with the use and development of power sites as may be authorized by law.

Approximately 3,500 acres in the study area are O&C lands, managed by the BLM under the authority of the O&C Act. The remaining public domain lands are managed for multiple resource use under the authority of the Federal Land Policy and Management Act of 1976.

Oregon Scenic Waterways Act

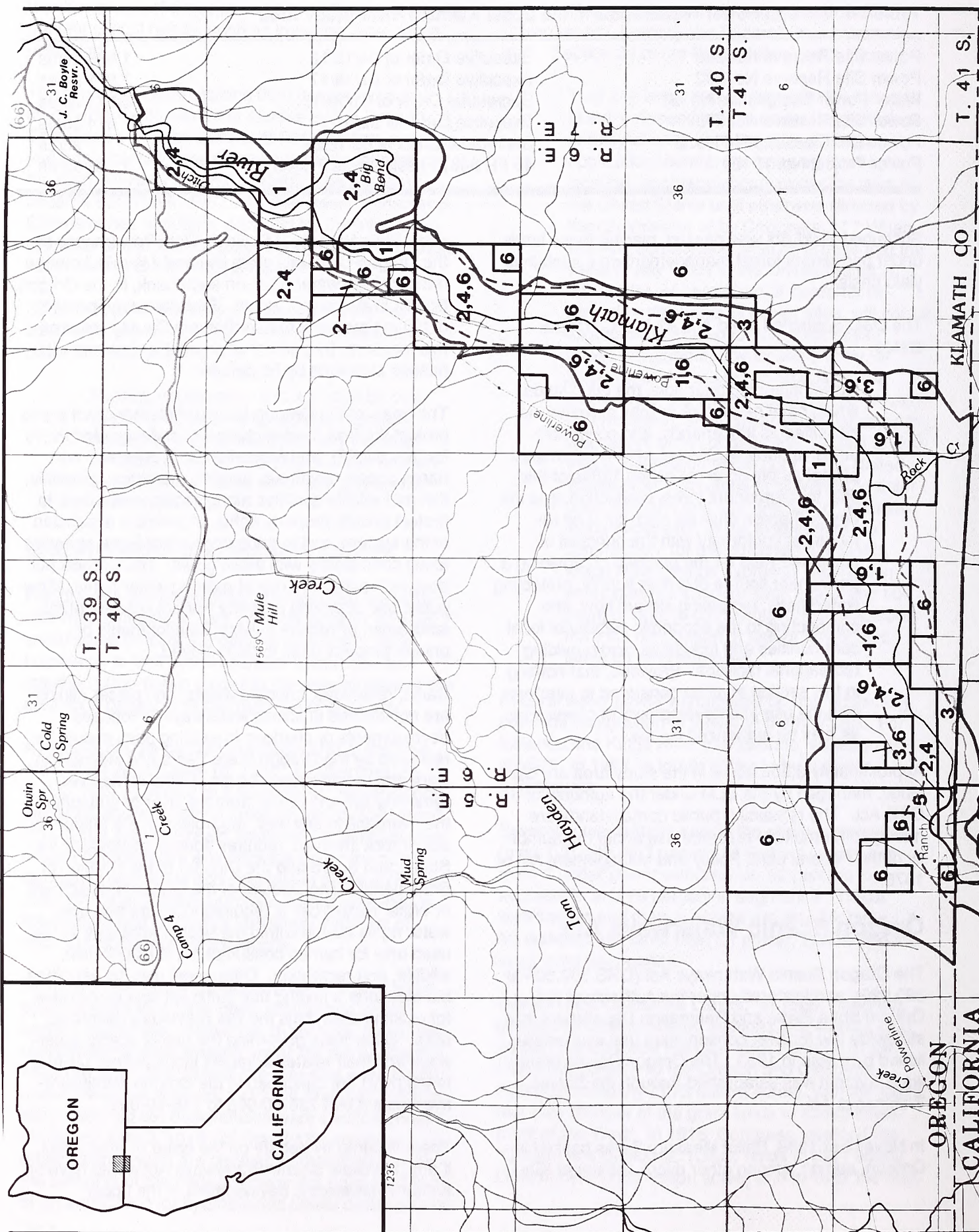
The Oregon Scenic Waterways Act (ORS 390.805 to 390.925), administered under the authority of the Oregon State Parks and Recreation Department, is a statewide law for river conservation that was established by a vote in 1969. The Oregon Scenic Waterways System was established through the Scenic Waterways Act.

In November 1988, Ballot Measure 7 was passed in Oregon, adding, among other rivers, the upper Klamath River from the J.C. Boyle Dam Powerhouse to the Oregon-California state line and 1/4-mile from the ordinary high water mark on each bank, to the Oregon Scenic Waterways System. Seventy-seven percent of the registered voters in Klamath County voted on this measure; 59 percent opposed the measure. It passed statewide by 55 percent.

The goals of the Oregon Scenic Waterways Act are to protect the free-flowing character of designated rivers for fish, wildlife, and recreation; to protect and enhance scenic, aesthetic, natural, recreation, scientific, fish and wildlife qualities along scenic waterways; to protect private property rights; to promote expansion of the system; and to encourage other State agencies to act consistently with these goals. The Oregon Act does not restrict the use of existing water rights, allow public use of private property without consent of the landowner, or require existing developments or private property uses to be removed.

Dams, reservoirs, impoundments, and placer mining are not allowed in scenic waterways. Proposed developments or changes in existing uses should be reviewed by the Oregon State Parks and Recreation Department before they occur. Filling in the river, removing soil and gravel from the river or changing the riverbank in any way, regardless of the amount of soil or rock involved, requires special approval of the State Land Board and the Director of the Division of State Lands. The Director of the Oregon Department of Water Resources is required to insure that new water rights issued within the scenic waterway will be used only for human consumption, livestock, fish, wildlife, and recreation. Other uses may be permitted, but only after a finding that sufficient flow is available for existing uses, plus the five previously described uses. Other rules governing the use of scenic waterways and their related adjacent lands (within 1/4-mile of the river) are described in the Oregon Administrative Rules (OAR 736-40-005 to 736-40-095).

There is currently debate on the issue of what effect, if any, the State Scenic Waterways Act would have on further hydroelectric development of the upper



Klamath River under FERC licensing authority. Nothing in this report should be construed as taking a particular position on this issue.

County Comprehensive Planning

The Oregon Land Use Act of 1973 requires that local comprehensive plans be consistent with the 19 statewide goals adopted by the State Land Conservation and Development Commission. Goal 5 "Open Spaces, Scenic and Historic Areas, and Natural Resources," provides for protection of a variety of natural and cultural resources, including "potential and approved federal wild and scenic rivers and state scenic waterways" through plan inventories and local regulations to prevent conflicting land uses to the extent possible. Cities and counties must adopt programs as elements of their comprehensive plans that will (1) ensure open space, (2) protect scenic and historical areas and natural resources, and (3) promote healthy and visually attractive environments in harmony with the natural landscape. The four resource categories in the Klamath River Canyon deemed significant by Klamath County in development of its 1984 comprehensive plan were hydro energy, the potential scenic waterway, fish and wildlife habitat (specifically riparian, deer winter range, bald eagle nests), and known cultural resources (prehistoric and historic).

The initial work conducted on Goal 5 resources in Klamath County was completed in June 1984 with acknowledgment of the Comprehensive Plan by the Oregon Land Conservation and Development Commission. In February 1988 the County amended the Comprehensive Plan designation for a variety of resources within the Klamath River Canyon in response to the City of Klamath Falls Salt Caves Hydroelectric proposal. This plan amendment was appealed to the Oregon Land Use Board of Appeals by a citizen's public interest group and two State agencies and was subsequently remanded to the County for further assessment (Oulman 1990, pers. comm.).

Klamath County's Comprehensive Plan Goal 5 element is currently being updated to reflect new inventory information, as well as changes incurred when Ballot Measure 7 was passed in November 1988, adding the upper Klamath River to the Oregon State Scenic Waterways System.

The other elements in Klamath County's Comprehensive Plan that are directly applicable to the upper Klamath River Canyon are Goal 1 (Citizen Involvement), Goal 2 (Land-Use Planning), Goal 4 (Forest Lands), Goal 6 (Air, Water, and Land Resources Quality), Goal 8 (Recreational Needs), Goal 9 (Economy), and Goal 13 (Energy Conservation). The State Department of Land Conservation and Development has overview responsibility for all of the statewide planning goals. The State Parks and Recreation Department has statutory involvement with Goals 5 and 8.

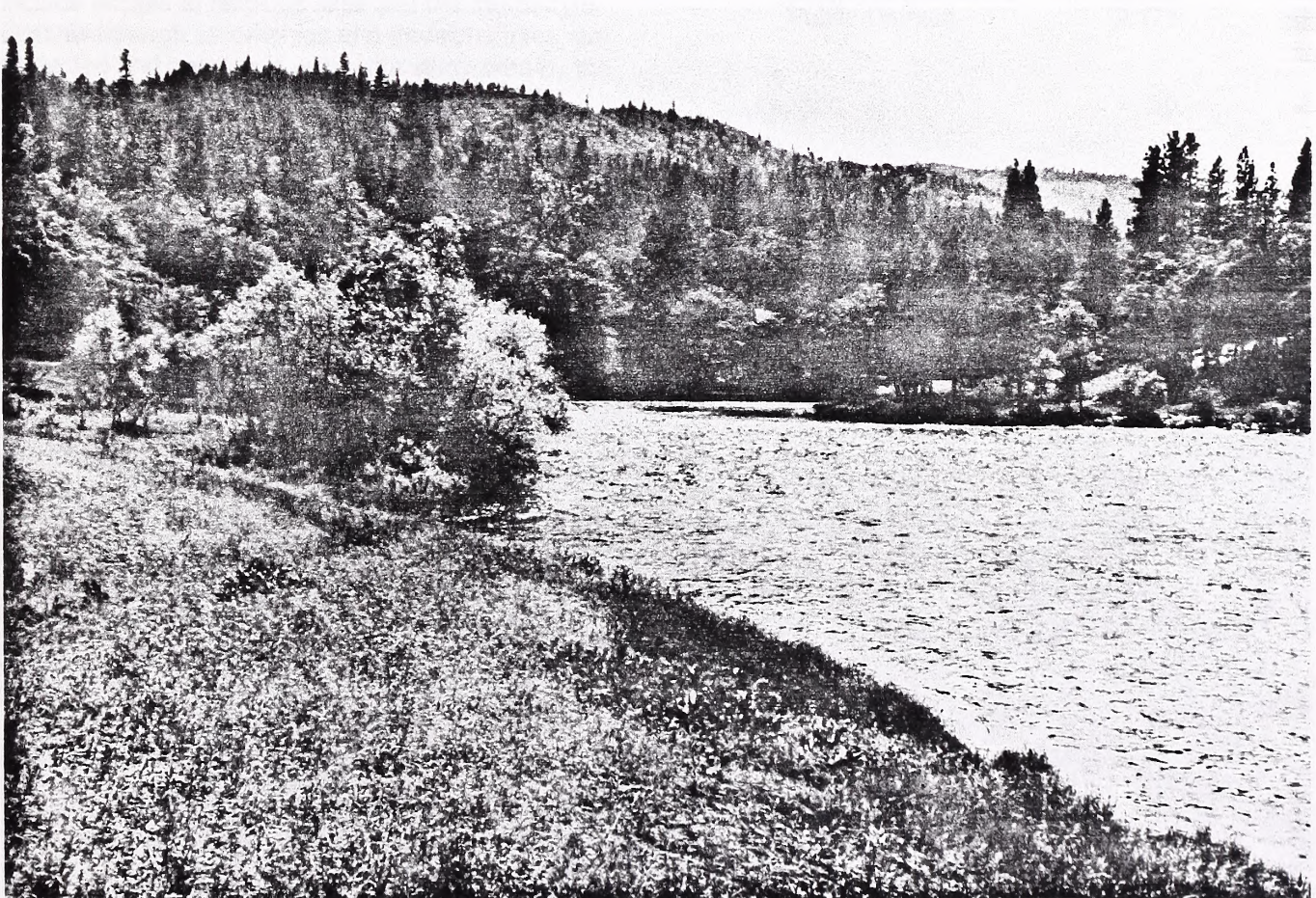
According to testimony given by Carl Shuck, Klamath County Planning Director, at the BLM Multiple Use Advisory Council meeting on December 7, 1989, the Klamath County Comprehensive Plan contains three policy statements that are directly relevant to the Klamath River Canyon. They are as follows:

Policy 31: At the time that rivers are studied for official designation as State Scenic Waterways or Federal wild and scenic rivers, the County and other State and Federal agencies shall cooperate in the study of rivers for inclusion in State or Federal designations and in the application of the Goal 5 rule.

Policy 32: Klamath County recognizes that certain uses contemplated for the Salt Caves (segment 2) and upstream reaches of the Klamath River are in conflict. A program to resolve these conflicts will be developed when formal application for either of the conflicting uses is made based on the economic, social, environmental, and energy consequences.

Policy 33: The County shall not support any potential river designation until intensive studies are made and areas adequately defined.

Chapter 2 – Existing Situation



Stretches of slow moving water occur in the lower portion of segment 2.

Introduction

This chapter describes the existing situation of the upper Klamath River Canyon, including the general setting, land uses, and a description of resource values.

General Setting

The general setting of the study area includes the physiography, land ownership, existing rights, socio-economics, regional transportation, and access.

Physiography

The Klamath River lies within the High Cascades physiographic province and borders the Basin and Range province on the west (Franklin and Dyrness 1973). These factors enhance the biological diversity found in the Klamath River Canyon. The only rivers in Oregon and California that bisect the Cascade Range are the Klamath and Columbia in Oregon and the Pit in California. The upper Klamath River drains south-central Oregon, east of the Cascade Range. The

river begins at the lower end of Lake Ewauna in the city of Klamath Falls, Oregon and flows southwesterly into California and west to the Pacific Ocean (map 1-1). The study portion of the upper Klamath River flows through a steep-walled, basalt canyon in Klamath County, Oregon and Siskiyou County, California.

The topography in the study area varies from flat to gently sloping along the river benches to near-vertical at the canyon walls. The canyon rim's basalt cliffs rise to 1,000 feet above the river. The average river gradient in segment 1 is 75 feet per mile; segment 2 is 27 feet per mile from RM 219.5 to 214.3, and 77 feet per mile from RM 214.3 to 209.3; and segment 3 is 32 feet per mile.

Annual precipitation, most commonly in the form of rain, ranges from 15 to 20 inches during fall, winter, and spring. Summer months are hot and dry with occasional thunderstorms developing in the late afternoon. In the winter, snow falls on the rim of the canyon, but only rarely accumulates on the canyon floor. Winter temperatures in the canyon drop into the low 20's and summer temperatures climb into the high 80's or 90's.



Steep canyon walls in segment 2.

Air quality is generally good within the canyon because it is far removed from population centers or industrialized areas.

Land Ownership

Land ownership within the study area boundary is as follows: segment 1, 70 percent BLM and 30 percent private; segment 2, 75 percent BLM, 2 percent State, and 23 percent private; and segment 3, 11 percent BLM, 2 percent National Forest Service, and 87 percent private ownership (map 2-1). In addition, the bed and banks of segments 1 and 2 are claimed by the State of Oregon (ownership of the bed and banks in segment 3 has not been determined at this time). Table 2-1 shows land ownership in both acres and percents, by segment.

Existing Rights

Rights-of-way for three powerlines and four roads totaling 27.3 miles in the study area affect 259 acres of Federal land. Table 2-2 summarizes the rights-of-way by segment. There are no existing mining claims. Pacific Power and Light owns three water right claims and the Oregon Department of Forestry has one water permit. Native American rights, which include access to religious sites and the freedom to worship through ceremonies and traditional rites, are protected and preserved within the study area by the American Indian Religious Freedom Act of 1978.

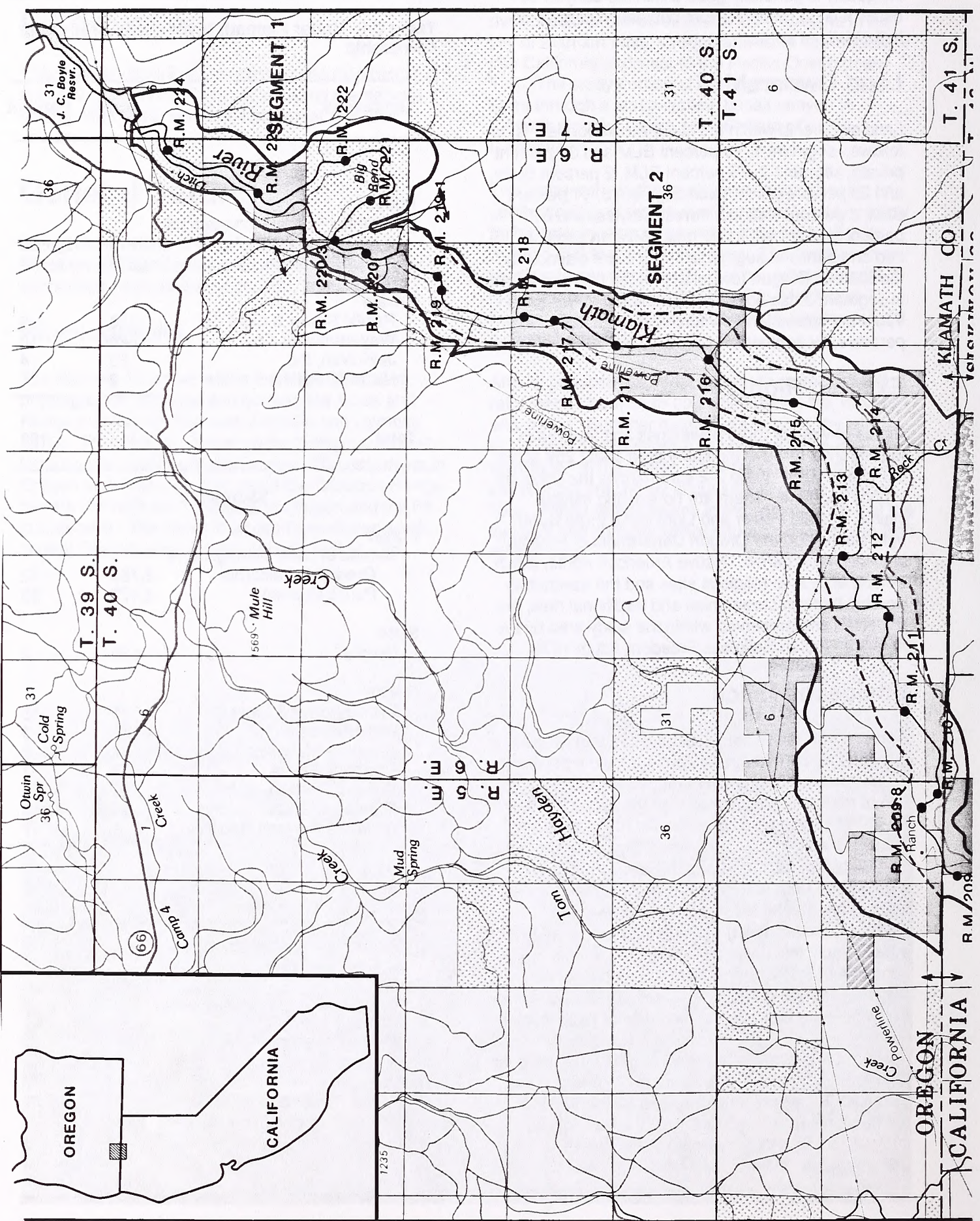
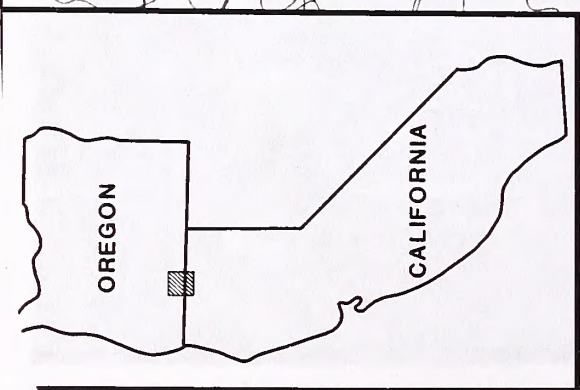
Socioeconomics

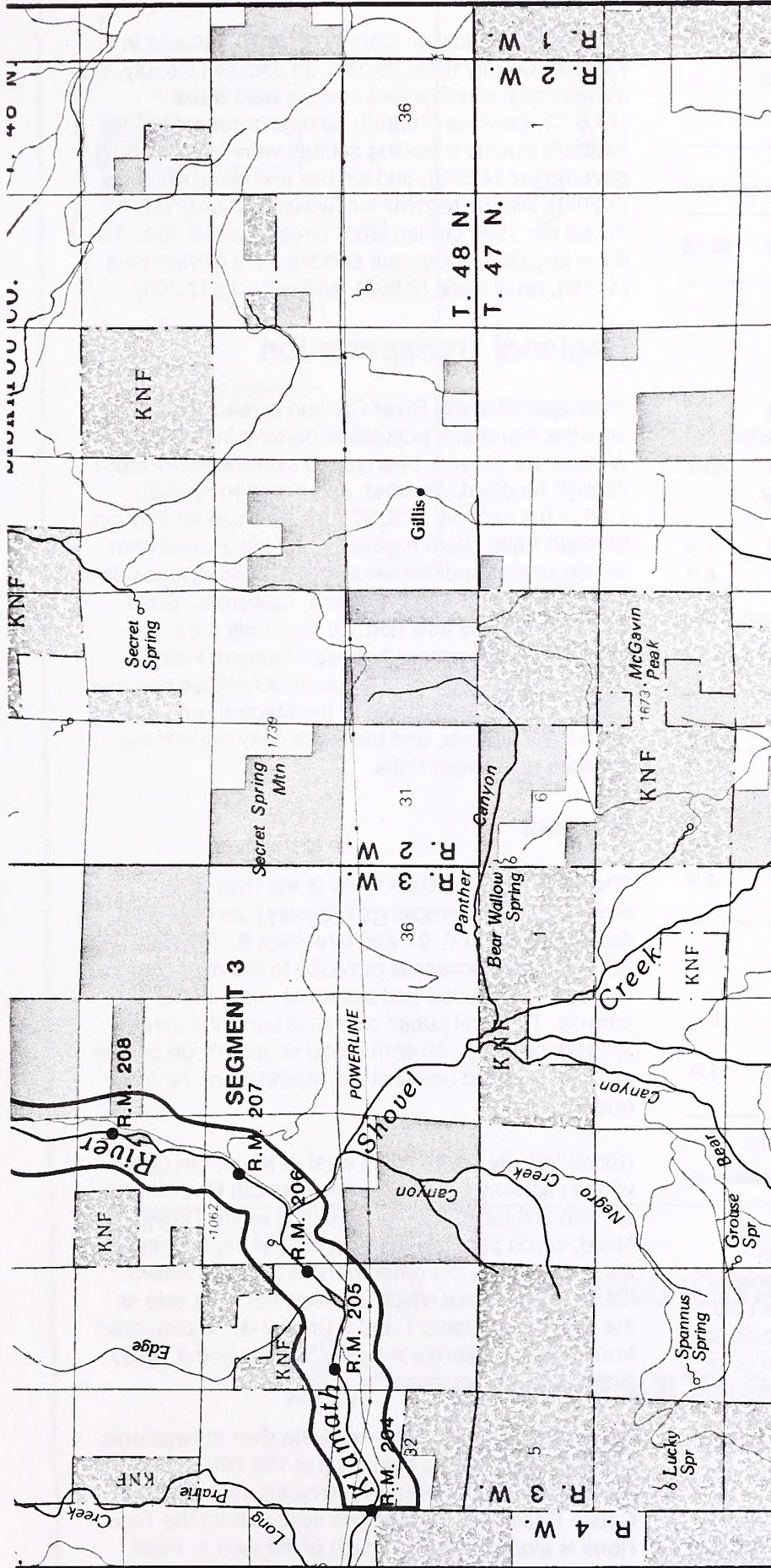
Population. Three counties, Jackson and Klamath in Oregon and Siskiyou in California, would most likely be affected by changes in management or reallocation of resources associated with the upper Klamath River. The estimated population in this area during 1988 totalled 248,200. The major population centers are: Ashland, 16,310; Klamath Falls, 17,220; Medford, 45,000; and Yreka, 6,746. Portland State University's Center for Population Research and Census (January 1989) estimates a net migration of 4,829 people into Jackson County and net out-migration of 5,132 people from Klamath County between 1980 and 1988. A source containing similar information for Siskiyou County has not been located.

Personal Income. Total personal income in 1986, as reported by the U.S. Department of Commerce, Bureau of Economic Analysis, was \$2.82 billion for the tri-county region. County totals are as follows: Jackson, \$1.66 billion; Klamath, \$0.65 billion; Siskiyou, \$0.51 billion. Siskiyou County has the

Table 2-1. Upper Klamath River Study Area Land Ownership

Landowner	Acres	Percent
Segment 1		
Public		
Bureau of Land Management		
Oregon & California	718	51
Public Domain	274	19
Private		
Pacific Power & Light Co.	128	9
Weyerhaeuser Co.	229	16
Jeld-Wen, Inc.	63	4
Hazel A. Simmon	2	<1
Total	1,414	100
Segment 2		
Public		
Bureau of Land Management		
Oregon & California	2,782	42
Public Domain	2,177	33
State		
Oregon	120	2
Private		
Pacific Power & Light Co.	991	15
Weyerhaeuser Co.	178	3
Joseph & Mary Ann Laubacher	157	2
Frederick Ehlers	157	2
James C. Brown	32	<1
Thomas J. Orr	14	<1
William & Carmen Hadwick	6	<1
Total	6,614	100
Segment 3		
Public		
Bureau of Land Management		
Public Domain	202	11
Klamath National Forest	41	2
Private		
Pacific Power & Light Co.	1,368	76
Southern Pacific Land Co.	202	11
Total	1,813	100





LEGEND

- Public Lands (Admin. by BLM)
- Oregon and California Lands (O&C Lands)
- National Forest
- State Lands
- Private Lands

R.M. 204 River Miles

MAP 2-1

UPPER KLAMATH RIVER LAND OWNERSHIP AND RIVER MILES

March 1990



Table 2-2. Upper Klamath River Study Area Rights-of-Way

Right-of-Way	Width (feet)	Length (miles)	
		Private	BLM
Segment 1			
Powerlines			
OR 24416	100	0.5	1.5
OR 17364	50	0.4	0.0
ORE 013482	-	0.0	<0.1
Roads			
OR 20608	60	0.0	1.8
Power Project #2082	100	2.0	4.3
Segment 2			
Powerlines			
OR 17364	50	1.1	5.7
OR 24416	100	0.0	0.5
Roads			
Power Project #2082	100	1.0	6.2
Access Road*	60	4.4	4.9
Segment 3			
Powerline	50	4.8	0.5
Topsy Road	100	4.9	1.8

*Includes portions of Topsy Road and the J.C. Boyle Powerhouse Access Road.

highest per capita income (\$11,918) followed by Jackson (\$11,880) and Klamath (\$11,305) counties. Agricultural uses dominate the rural areas within the region. Personal income attributed to the agricultural sector with the percent of total personal income is as follows: Jackson, \$28 million (1.7 percent); Klamath, \$21 million (3.2 percent); and Siskiyou, \$14 million (2.7 percent). An average of 6.1 percent of total farm sales in Oregon are from Jackson and Klamath counties together.

Employment. The Oregon Employment Division in its 1988 annual employment report, estimated the civilian

labor force in Jackson County to be 70,700 and in Klamath County to be 25,100. In Jackson County, the three largest employment sectors were trade (14,600), services (10,900), and government (9,400). Klamath County's leading sectors were trade (5,000), government (4,500), and lumber and wood products (3,700). Similar records for Siskiyou County estimated the 1988 civilian labor force to be 18,800. The three largest employment sectors were government (4,200), retail trade (2,600), and services (2,200).

Regional Transportation

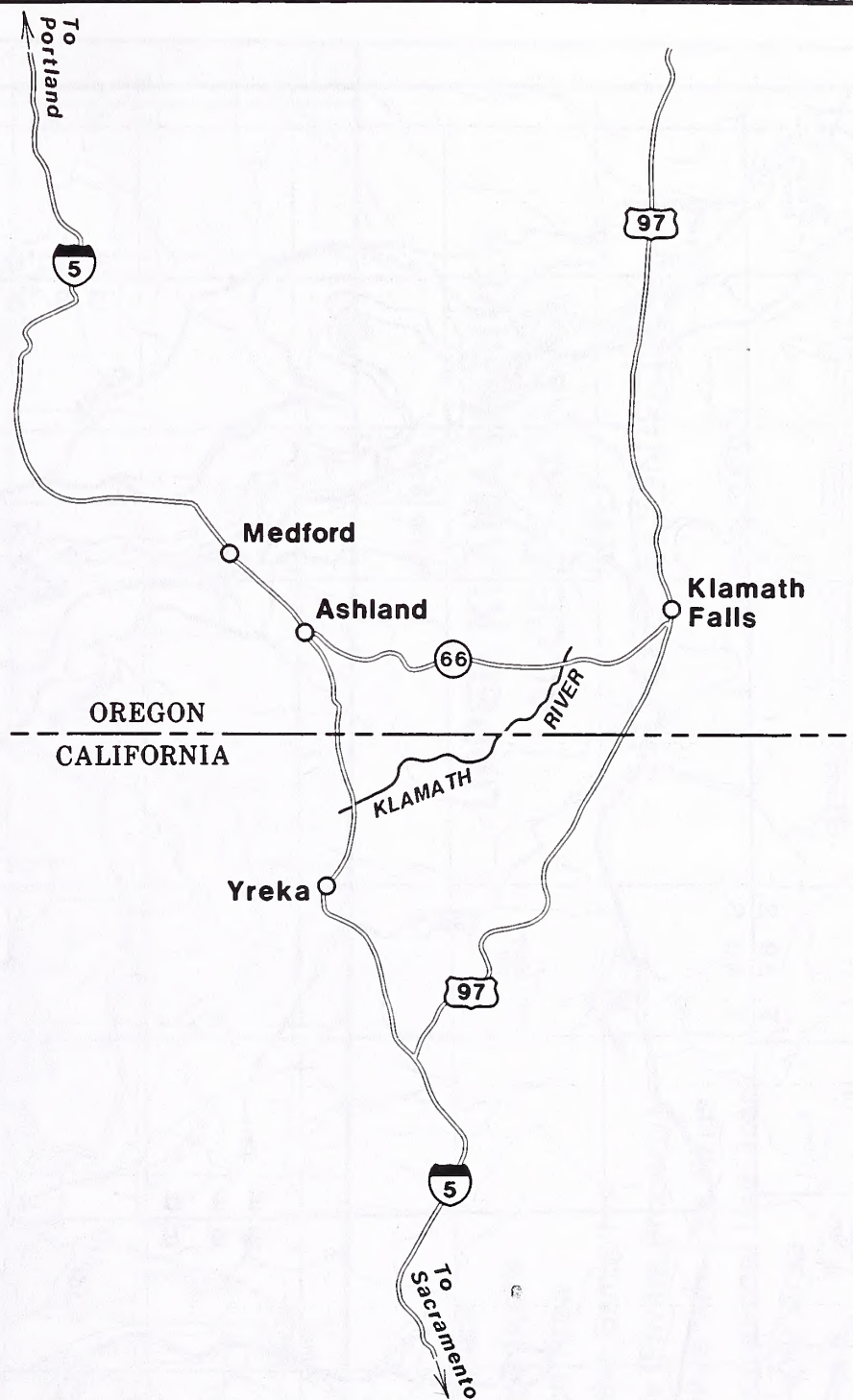
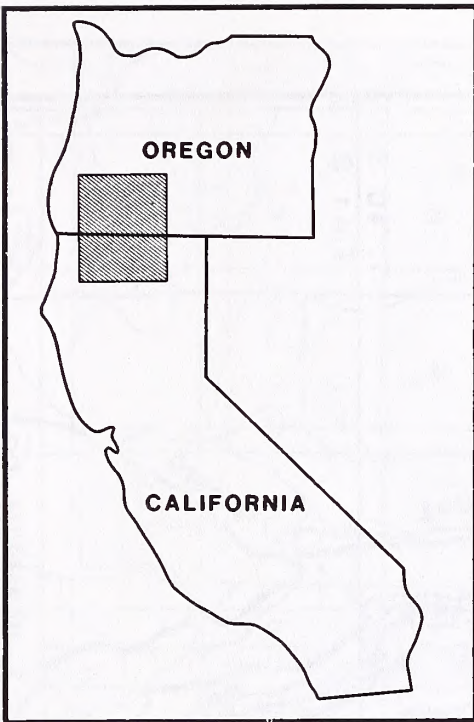
The upper Klamath River Canyon is readily accessible from the four major population centers in the region. West of the canyon, Interstate 5 extends north-south through Medford, Ashland, and Yreka (map 2-2). East of the canyon, U.S. 97 runs north-south through Klamath Falls. Both highways provide access from the major metropolitan areas of Portland, Oregon and Sacramento and San Francisco, California. State Highway 66, one mile north of the study area, provides east-west access between Klamath Falls, Ashland, and Medford. Regularly scheduled commercial air service is available at the Medford and Klamath Falls airports, and there are daily rail and bus services to Klamath Falls.

Access

The main transportation route to the river is by Highway 66 (Greensprings Highway), an east-west route between U.S. 97 and Interstate 5. Physical and administrative access is provided to the river corridor by several improved and seasonal roads in the canyon. Physical public access is currently unrestricted; however, on some road segments on private land, legal public use is at the discretion of the land owner.

Approximately seven miles west of Keno, Oregon, where Highway 66 crosses the Klamath River there are two access roads—one leading to the Topsy Road, which parallels the east side of the river in all three segments, the other to the J.C. Boyle Powerhouse access road which parallels the west side of the river in segments 1 and 2 (map 2-3). Picard road from Dorris, California provides access to the Topsy Road from the southeast.

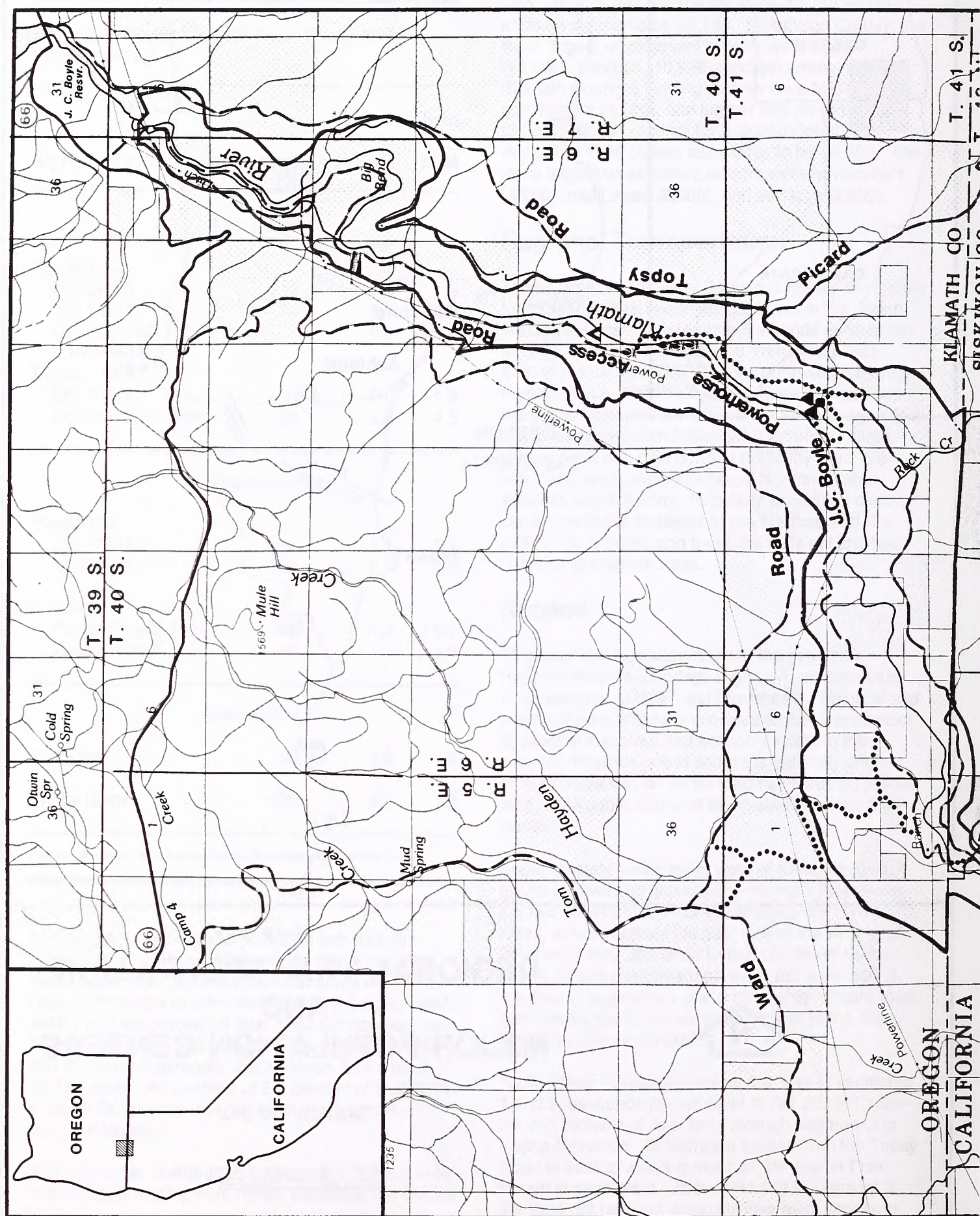
Topsy Road travels high above the river in segments 1 and 2, descends to river level at RM 208 in California and remains at river level through segment 3 to Copco Reservoir. Streamside access from the Topsy Road is available during much of the year at Frain Ranch in segment 2. Above RM 209 in segment 3 the BLM raft take-out area provides easy access to

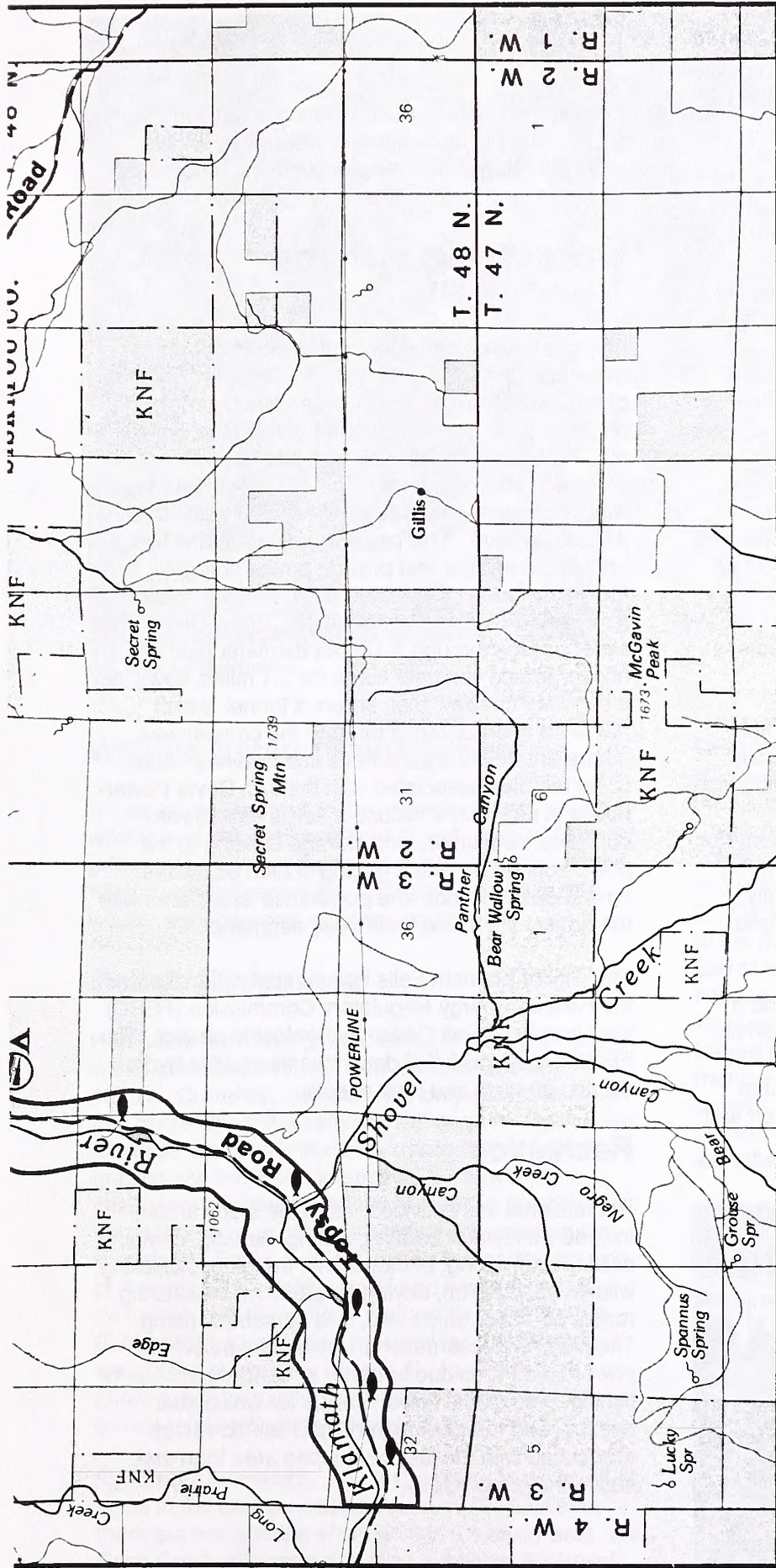


MAP 2-2
**REGIONAL TRANSPORTATION
AND
MAJOR POPULATION CENTERS**

March 1990

10 0 10 20 Miles
A scale bar with markings for 10, 0, 10, and 20 miles.





LEGEND

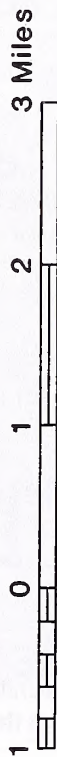
- Highway 66
- - - Primary Access Roads
- Secondary Access Roads
- ~~~~~ BLM Raft Launch Area
- ▲ BLM Semi-Primitive Campsites
- Primitive Campsite (Private Property)
- Primitive Campsites with Fire Rings
- Primitive Campsites with Fire Rings
- Frain Ranch (Recreational Use Area)
- BLM Raft Take-Out Area
- 🐟 Fishing Access Points
- - - SRMA Boundary



MAP 2-3

UPPER KLAMATH RIVER ACCESS ROADS AND RECREATION SITES

March 1990



the river. There are five designated fishing access points to the river on private land with parking spaces along Topsy Road in segment 3 that are provided by the Pacific Power and Light Company (PP&L).

The graveled J.C. Boyle Powerhouse access road enters the study area above the forebay in segment 1 (RM 223) and travels along the western canyon wall. The road generally remains far above the river, descending to streamside only at the powerhouse area, the BLM campsite (approximately RM 217), and at the Oregon-California border, where it ends. A graveled flume maintenance road, adjacent to the concrete flume, also travels along the western canyon wall in segment 1.

Access to the Klamath River from the powerhouse road is present in segment 1 at the northern study area boundary. In segment 2, river access is present at the powerhouse (RM 220.3), the BLM raft launch area (1/4-mile downstream from the powerhouse), the BLM campsite (RM 217), Frain Ranch (RM 215), 1/4-mile downstream from Frain Ranch, and across from the Salt Caves (RM 211.8).

From the northern study area boundary to approximately RM 213, the powerhouse road is generally passable year-round. This access road is maintained from Highway 66 to the powerhouse by PP&L. Beyond the powerhouse, the unimproved access road consists of a single-lane, rocky roadbed. From RM 213 to the state line, the road is used seasonally because it is usually impassable in the winter and early spring due to snow and mud.

Other roads on the west side of the river include a seasonal dirt road that begins above the canyon rim and intersects the powerhouse access road at RM 211 and 209.5, and a seldom used jeep road that parallels the river between the powerhouse road and the river, between RM 216.3 and 215.



Powerhouse access road near BLM boat launch site.

Land Uses

Land in the Klamath River Canyon is used for energy generation and transmission, recreation, wildlife habitat management, range resources, timber management, and Native American traditional use.

Energy Generation and Transmission

There is high potential for hydroelectric energy generation on the Klamath River. The study portion of the Klamath River lies between two hydroelectric projects—J.C. Boyle in Oregon and Copco in California. Hydroelectric facilities also exist below the Link River and Irongate dams. The J.C. Boyle 88-megawatt power generation plant is 4.6 river miles below J.C. Boyle Dam. This peaking operation has two turbine generators that provide power during high use (peak) periods. Up to 2,500 cubic feet per second (cfs) of flow can be diverted at J.C. Boyle Dam. This water passes through a 14-foot diameter pipe into an above-ground concrete flume for 2.1 miles, flows into a concrete forebay, then enters a tunnel, which passes a short distance through the canyon wall, before entering the penstocks and turbines. Additional facilities associated with the J.C. Boyle Powerhouse in segment 2 include a surge tank, three duplexes, substation, and storage building at the powerhouse site, and a gaging station below the powerhouse. Roads and powerlines associated with the project are found in all three segments.

The City of Klamath Falls has an application filed with the Federal Energy Regulatory Commission (FERC) for a proposed Salt Caves hydroelectric project. The FERC's May 1990 EIS describes alternative hydroelectric projects and their effects.

Recreation

Recreational use activities within the study area include whitewater boating, fishing, hunting, camping, sightseeing, hiking, photography, trapping, picnicking, wildlife observation, driving for pleasure on existing roads, off-road vehicle use, and horseback riding. The majority of recreational use occurs below the powerhouse area due to better streamside access for fishing, predictable flows suitable for whitewater boating, and the more natural and scenic values associated with the less developed area than that above the powerhouse.



J.C. Boyle Powerhouse.

Wildlife Habitat Management

An important land use in the Klamath River Canyon is wildlife and fish habitat management. The BLM is the primary agency that manages public lands for wildlife habitat, while Oregon and California State fish and wildlife agencies manage the populations.

Range Resources

Homesteaders have grazed cattle, sheep, and horses within the Klamath River Canyon since the late 1800's. Currently, cattle are the only domestic stock that graze within the canyon. Although no figures are available on historic livestock use in the canyon, grazing use has been intense as evidenced by a change from native perennial grasses to invading non-native annual grasses currently dominating the rangeland. Cattle, wildlife, and on the northwest side of the canyon, a small herd of wild horses, compete for forage. Weyerhaeuser Corporation, PP&L, and BLM-administered lands are used for grazing in and around the study area (map 2-4). In addition to grazing, hay production is a common land use on private lands adjoining the river in segment 3.

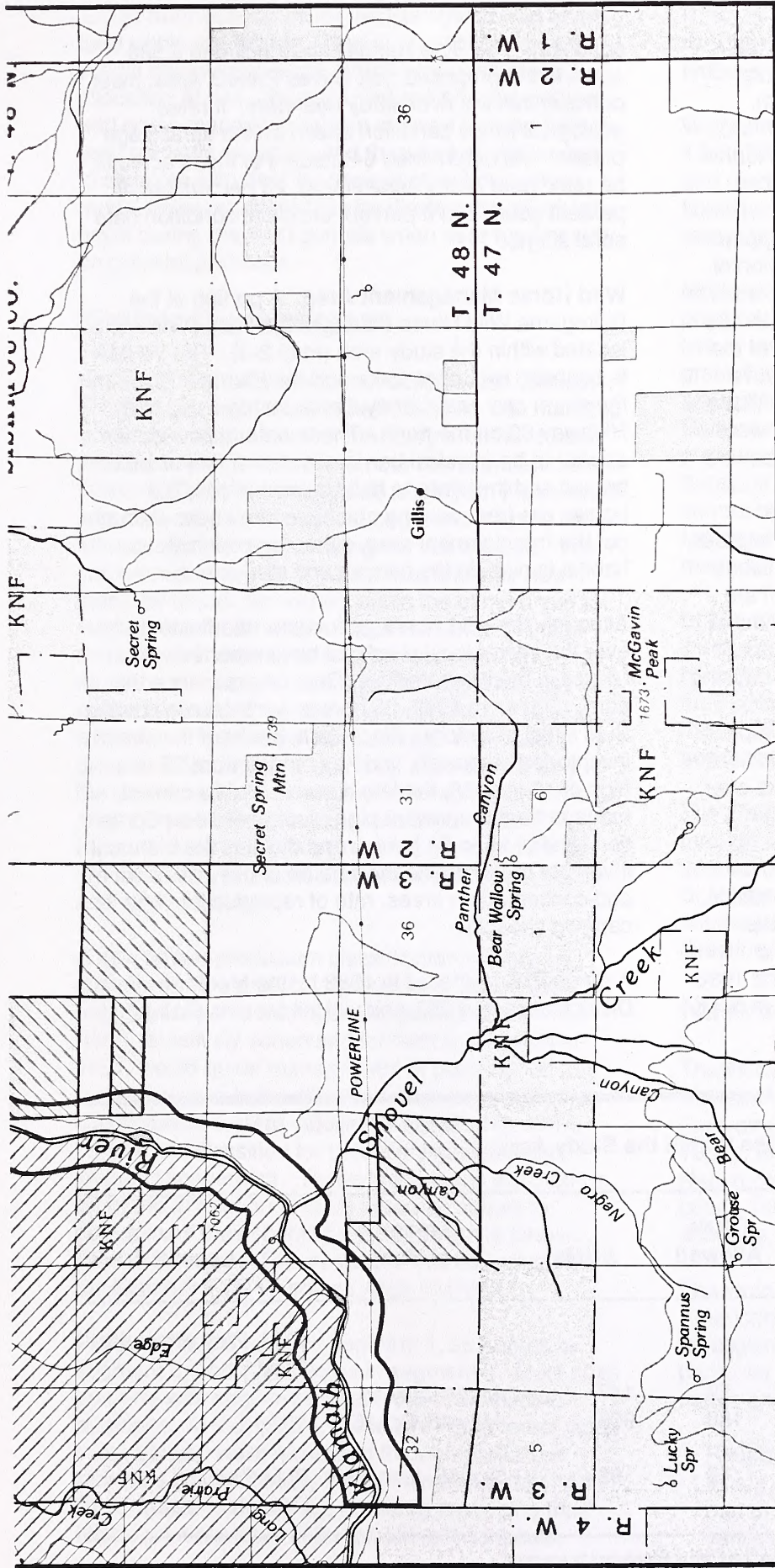
Existing Allotments. The first grazing lease on BLM lands in the canyon was issued in 1960. Currently there are two grazing allotments in the study area, the Edge Creek Allotment and the Laubacher Allotment.

The Laubacher Allotment, located entirely in California, covers 1,840 acres of BLM land. Only 200 acres fall within the study area. The majority of the Edge Creek Allotment (8,860 acres of which are BLM-administered) is outside the study area, but a portion of it is located on BLM and private lands in segment 2. The portion in the study area extends from the rim to the river's edge and includes a total of 3,817 acres, 980 of which are private. This allotment is divided into the Ward Pasture to the south and the North Pasture. Pacific Power and Light Company has issued two grazing permits in the Edge Creek Allotment. Most of its leased land is within the study area. Leases issued by PP&L do not limit numbers of cattle, season of use, or quantity of forage consumed, but do set other guidelines to which lessees must adhere.





Grazing on the Laubacher Allotment is currently permitted on BLM lands in segment 3 and also occurs on private land adjacent to the river, which is primarily pastureland and residual forage following hay production.

Although not within the study area, two other BLM allotments border the rim on the east side of the canyon adjacent to segments 1 and 2.

Table 2-3 shows that the grazing season on BLM leased lands begins in April on the Laubacher Allotment, where early spring greenup provides the first



LEGEND

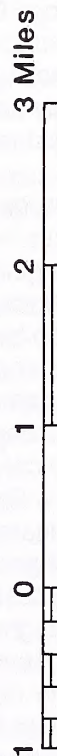
-  Pokegama Wild Horse Management Area
-  Grazing Allotments
-  Study Area Boundary
-  Oregon State Scenic Waterway

MAP 2-4

UPPER KLAMATH RIVER GRAZING ALLOTMENTS AND WILD HORSE MANAGEMENT AREA



March 1990



available forage. Cattle are then moved onto the Edge Creek Allotment from May to July to graze meadows and flat terrain along the riverbottom, accessible benches above the river, and the Ward Pasture. Finally, the cattle are moved to the North Pasture for the remainder of the grazing season.

Range Condition. Impacts from past grazing practices have resulted in the vegetative composition of rangelands changing from perennial native grasses to introduced annual species. Riparian vegetation has also been impacted by grazing. The portions of the canyon that have retained their natural vegetative composition are primarily in steep topography that are inaccessible to livestock. Native grasses that were typical of the once dominant perennial range but are now limited, include Idaho fescue, bluebunch wheatgrass, pine bluegrass, few-flowered wild oatgrass, melic grass, and needle grass. Cheatgrass, medusahead wildrye, two-flowered fescue, bulbous bluegrass, foxtail barley, thistle, and dandelion are presently found, indicating an annual rangeland and poor range condition. All of these annuals are poor forage for both livestock and wildlife. Factors causing this change include early spring grazing, historical burning, natural erosion, trampling and soil compaction by livestock, and overgrazing. These conditions favor the weedy annual species that easily take over the native perennial plants and grasses.

Two studies have been done in the Klamath River Canyon in relation to vegetation and range condition, one by the Medford District BLM in 1981 and the other for the proposed Salt Caves hydroelectric project by the City Of Klamath Falls in 1984 and 1986. Both studies determined the rangelands to be in poor

condition. The BLM Range Study included 5,580 acres in the proposed Salt Caves Project Area, most of this within the river study boundary. It rated ecological range condition based on the seral stage present and determined 64 percent of these acres to be rated poor (early seral stage), 28 percent fair, 8 percent good, and 0 percent excellent condition (late seral stage).

Wild Horse Management Area. A portion of the Pokegama Wild Horse Management Area (WHMA) is located within the study area (map 2-4). The WHMA is bounded by Copco Lake and the Klamath River on the south and east, Jenny Creek on the west, and Highway 66 on the north. These natural boundaries appear to be physical barriers to movement of wild horses and therefore to habitat expansion. The horses are free roaming and have been seen throughout the management area, although most high use habitat is outside the canyon and study area.

Although the wild horse population has fluctuated over the years, local residents have reported wild horses in the Klamath River Canyon area since the early 1900's. In 1972, 25 horses were counted during BLM's first inventory. Since then, the herd has been inventoried biannually and has ranged from 25 to a high of 42 in 1988, the latest count. BLM's current management framework plan recommends a population level of 25 to 50 horses and dictates the biannual inventory to determine the season of use, distribution and concentration areas, rate of reproduction, and carrying capacity.

A range EIS, prepared in 1983 by the Medford District, allocated 250 Animal Unit Months (AUMs) of

Table 2-3. Grazing Leases and Season of Use Within the Study Area

Lease	Lease Number	Cattle Allowed	AUMs ¹	Season of Use	Lessor
Edge Creek Allotment	0102				BLM, Weyerhaeuser, PP&L
Ward Pasture		59	147	May 1-July 15	
North Pasture		180	905	May 15-Oct 15	
Laubacher Allotment ²	0155	46	92	Apr 15-June 14	BLM Redding Resource Area

¹Animal Unit Month (AUM) - the amount of forage necessary for the sustenance of one cow or its equivalent for one month.
²This lease administered by Klamath Falls Resource Area.

forage from BLM lands for the Pokegama wild horse herd within the WHMA. Part of the WHMA is within critical deer winter range, which was considered in allocating AUMs. Studies conducted for the original wild horse management plan showed that the horses feed primarily on grass, and therefore do not appear to compete with deer for browse on critical winter range; however, there may be direct competition for grass during greenup periods when deer feed heavily on grasses and forbs.

Timber Management

Under current management direction in the Jackson-Klamath Management Framework Plan, less than 200 acres of public land within the study area have been classified as high intensity timber management lands. There has been no timber sale activity on these small parcels scattered throughout segments 1 and 2 in the Klamath River Canyon during the last decade. The current management direction is to allow no new roads for timber harvesting within the canyon and to manage the lands under Visual Resource Management Class II standards to retain the existing character of the landscape. Management activities may be visible but should not attract attention of the casual observer. Timber harvest to salvage fire-, insect-, or disease-killed timber is currently allowed, but only to the extent required to enhance the recreation experience. Current forest management activities in the Klamath River Canyon by both the BLM and PP&L are minimal and oriented toward recreational, scenic, and wildlife values.

A new timber production classification system was completed as a preliminary inventory step in the ongoing resource management plan process. The RMP, tentatively scheduled for draft publication in 1991, would guide management of public lands and their resources in the 1990's. In the new production classification system, additional forest lands in the canyon are classified for potential high intensity timber management. These forest lands will then be analyzed in relation to other resource values to determine if they should be included in the timber production base. This evaluation will be included in the Klamath Falls Resource Area RMP/EIS.

PP&L owns 128 acres in segment 1, 991 acres in segment 2, and 1,368 acres in segment 3. Most of its property was acquired primarily for hydroelectric purposes. In the 1970's, some of PP&L's forest lands in the canyon were harvested through partial cut removals. There is very little commercial timber on PP&L lands, and they are presently managing their timber on a short-term, limited harvest schedule.

PP&L is currently formulating a comprehensive plan for long-term management direction, which includes timber management.

Weyerhaeuser Company owns 229 acres in segment 1 and 178 acres in segment 2. Most of these lands and roads, which are open to the public for recreational purposes, are above the canyon so that visual resources are not greatly affected by timber harvest.

Increases in recreation use, timber harvest, and private land developments, combined with the difficulties of ensuring an aggressive fuels reduction program, have increased fire risks and hazards in and around the canyon. Fire season in the Klamath River Canyon normally starts in June and lasts until approximately mid-October, but each year's season depends on annual weather conditions. Thunderstorms can occur throughout the spring, summer, and fall, occasionally starting lightning-caused fires, the main cause of fires in the canyon.

BLM fuels management activities surrounding the study area consist of burning slash from timber harvesting and broadcast burning timber and brush fuels. Prescribed fire has been used by the BLM in the study area to improve and protect wildlife habitat and livestock forage production.

The Oregon Department of Forestry is contracted through fiscal year 1991 by the BLM to provide fire suppression and pre-suppression in the area. The BLM provides guidance to the Department on resource protection and overall fire management direction.

Native American Traditional Use

Traditional use by Native Americans of the upper Klamath River Canyon began before contact with Euro-americans and has continued into the present. Today, members of the Klamath Tribe and the Shasta Nation continue to use the canyon for spiritual purposes, hunting, fishing, gathering, and other cultural activities.

The various forms of spiritual use of an area by Native Americans do not fall within categories readily familiar to religions of western society. Religious use of a particular area encompasses a wide range of elements and observances.

Rituals can be practiced on an individual level where a person observes a particular practice as part of their daily activities. Small group observances might involve a family group with a religious

specialist (shaman/"doctor") who, with esoteric knowledge has special access to supernatural power often used for curing or life crisis events. Other rituals and ceremonies involve the participation of all society's members in events considered to be vital to the society as a whole (essential resources such as fish, acorns, epos). These larger rituals renew and emphasize members' needs for, and dependence on, the total society. The rituals must be performed properly according to well established rules. A meaningful ritual involves time, place, and symbolic objects. These along with words are considered sacred and are treated with respect (Theodoratus et al. 1989).

The physical environment is an elementary aspect of traditional use of an area.

The concept of spiritual/supernatural power invested throughout the environment is a basic element in all Native American religions in the study area. Each individual has access to these spirits with the shaman at the pivotal point with the ability to heal. The cultures in the study area had [have] strong development of the religious concepts through their intimate day to day contact with the environment (trees, rocks, springs, weather, shapes, animal life, etc.) many which potentially contained power. The spirit world was [is] embodied in myth which explains the relationships between people, the environment and power, both benign and malevolent. As a result of this emphasis on power, religious behavior has focused on the individual—often the shaman. Spirit quests by individuals at special locations imbued with supernatural qualities were [are] important as were [are] special curing rituals aided by the shaman's use of various rituals and traditionally important herbs (Theodoratus et al. 1989).

The river and canyon are considered to be a sacred site by the Klamath and Shasta, because of historical use by tribal ancestors and present day use by tribal members. From a spiritual perspective, the River expresses the value of life to the Klamath tribe.

Its location and terrain have made it a locus of power for vision and crisis quests. Innumerable stone cairns throughout the canyon attest to its long and continued spiritual use. These cairns are pages in the Klamath people's history, a very real conduit to the lives and spirits of those who walked the earth in the near and distant past. Further, the land and River itself are spiritually powerful to the Klamath people. In the Native American world-view, unlike that of Euro-americans, the land and the lives of the people who inhabit it are inextrica-

bly intertwined; to destroy the land is to unravel the fabric of life within which the people live. The upper Klamath River is one of the few parts of the region left that has been relatively untouched by development over the past one hundred and fifty years. For the Klamath and their neighboring tribes, the River and its canyon are very much a part of what makes them a people (Klamath Tribe 1989, pers. comm.).

A similar point of view is expressed by the Shasta. The study area includes burial grounds of the Shasta and principal ceremonial areas, which are used for spiritual and educational purposes. To the Shasta, this area represents a crucial link with the spiritual world.

For generations individual members, our spiritual leaders, and medicine persons have traveled to these burials to communicate with the Great Creator, to perform rituals, and to prepare for specific religious and medicinal ceremonies. * * * The area contains places where our medicine people ascend, as they have throughout history, to their position. * * * the first medicine power was received there, and the first practitioners of that power were brought forth and taught there. * * * Guidance for daily life and for crises that individuals in the tribe must face comes from those sites (Hall 1985).

Native Americans also value the canyon for other important cultural activities. The river area has long been used for fishing, gathering, and hunting; as a meeting place between the area's various tribes and bands; as shared fishing villages; and as a site of inter-tribal exchange and communication. The area also contains archaeological and environmental information and material that sheds light upon the culture and history of the Klamath, their neighbors, and their ancestors (Klamath Tribe 1989, pers. comm.).

Description of Resources

The existing resource values in the study area are described in this section and are the basis for the determination of eligibility in chapter 3.

Recreation

The major recreational activities within the study area include whitewater boating, fishing, hunting, and camping. Additional activities include sightseeing, hiking, photography, picnicking, wildlife observation, driving for pleasure on existing roads, trapping, off-

road vehicle use, and horseback riding. Most recreational use occurs below the J.C. Boyle Powerhouse in segments 2 and 3. The lower half of segment 1 and all of segment 2 are managed by the BLM primarily under a semi-primitive motorized recreation opportunity spectrum class, with emphasis on floatboating, fishing, camping, and other compatible uses. Segment 3 is managed under a roaded natural recreation opportunity spectrum class. The six recreation opportunity spectrum classes are described in appendix A. In the Klamath River Recreation Area Management Plan, the carrying capacity for all recreation uses was determined to be 12,500 visitor use days annually (BLM 1983).

Existing recreation facilities include a raft launch area, primitive and semi-primitive campsites, a raft take-out area, and five fishing accesses. The recreational values of the study area are presently recognized by a number of other agencies and organizations, including the National Park Service (Nationwide Rivers Inventory), Oregon Department of Energy (Pacific Northwest Rivers Study), Oregon Department of Fish & Wildlife (direct testimony, 1985), and the Oregon State Parks and Recreation Division (Statewide Comprehensive Outdoor Recreation Plan). In addition, the upper Klamath River was designated a State Scenic Waterway by majority vote in Oregon in 1988.

Whitewater Boating. In Oregon, there are approximately 112,600 miles of rivers and streams, of which approximately 1,200 miles are currently considered suitable for recreational whitewater boating. Few of these rivers are capable of being floated year-round because of seasonal low water (Lilly 1985). There are approximately 370 miles of whitewater boating rivers in Jackson, Josephine, Curry, Klamath, Douglas, and Siskiyou counties, of which the upper Klamath River accounts for 17 miles. The remaining 353 miles of whitewater boating opportunities occur

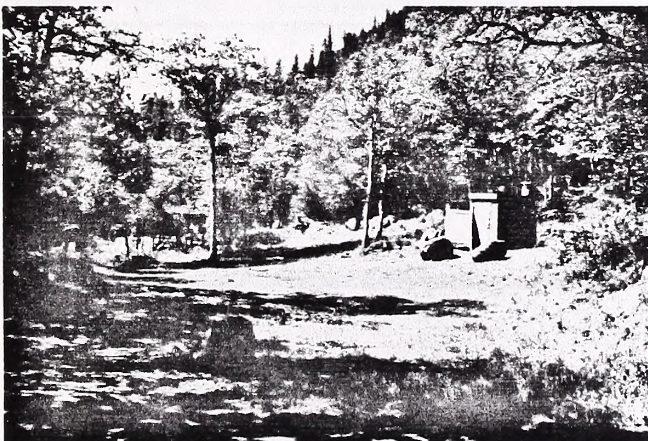
on six rivers (Rogue, Illinois, Umpqua, lower Klamath, Scott, and Salmon). The upper Klamath River is the only river in Klamath County that sustains any significant whitewater boating activity. Table 2-4 shows whitewater boating rivers in Oregon and northern California (north of Sacramento).

One of the unique features of the upper Klamath River is the late season whitewater boating opportunities provided as a result of year-round releases from the J.C. Boyle Dam/Powerhouse system. At least one generator must be operating to provide adequate flows for whitewater rafting. Even if neither generator is operating, the river can still be floated by kayak or canoe from the BLM launch site to Frain Ranch (5 miles). During typical summer operations, one generator operates daily between 4 a.m. to 4 p.m., increasing the river flow from approximately 350 to 1,500 cfs—the minimum raftable flow required in segments 2 and 3 (BLM 1989). Each July, generators are shut down for two weeks to allow maintenance on the powerhouse. During winter and spring, both generators operate, increasing the flows to 2,500 cfs or higher. Adequate flows for boating opportunities upstream from the powerhouse are available only when excess water is released from the dam (usually late winter and early spring).

The upper Klamath River offers exceptional whitewater boating opportunities downstream from the J.C. Boyle Powerhouse. There are 74 rapids in the study area below the BLM raft launch area (RM 220.1). This is more rapids than in a comparable length on most other rivers in the western United States. Rapids are given a difficulty rating of I to VI on the International Scale of River Difficulty. The rapids on the upper Klamath River can be divided into three sections based on similar river difficulty ratings, shown in table 2-5. The river in the first section, RM 220.1 to 214.3, drops 27 feet per mile creating less technical rapids (Class I-III) for novice boating opportunities.

In the second section, RM 214.3 to 209.3, the river drops 77 feet per mile creating several long, turbulent rapids that require precise, expert maneuvering and provide challenging whitewater skills (Class III-V). The short distance of this section, combined with the quantity and classification of rapids, provides an experience not found on other rivers in Oregon and northern California.

The lower section, RM 209.3 to 204, drops 32 feet per mile creating rapids similar to those in the first section (Class I-III) that are suitable for novice boating opportunities.



BLM boat launch site, RM 220.1.

Table 2-4. Whitewater Boating Rivers in Oregon and Northern California¹

	Season Runnable for Given Class of Rapids	General Whitewater Classification	Controlled Flow	Trip Length (days)	Floatable River Length (miles)
Oregon					
Lower Rogue ²	Year-round	Class II-IV	Yes	1-5	84
Snake-Hell's Canyon ³	Year-round	Class III-IV	Yes	1-5	49
Upper Klamath²	Year-round	Class III-V	Yes	1-2	17
John Day (Lower) ³	Dec-June	Class II-III	No	1-5	69
Illinois ²	Mar-May	Class III-V	No	3-5	40
Owyhee (Lower) ³	Mar-June	Class III-IV	No	3-5	55
Owyhee (Upper) ³	Mar-June	Class III-V	No	3-5	39
Clackamas ³	Apr-June	Class III-V	Yes	1	20
Grande Ronde ³	Apr-June	Class II-III	No	1-4	44
North Umpqua ³	Apr-June	Class III-IV	No	2	33
Lower Deschutes ³	Apr-Sept	Class III-IV	Yes	1-3	99
Upper Deschutes ³	Apr-Sept	Class II-IV	Yes	1-2	54
California					
Lower Klamath ²	Year-round	Class III	Yes	1-5	100 +
S. Fork American ³	Year-round	Class II-III	Yes	1-2	30
Trinity ³	Year-round	Class II-III	Yes	1-3	83
Salmon ³	Nov-June	Class III-V	No	1-3	21
Scott ²	Dec-June	Class III-V	No	1-2	18
Upper Sacramento ³	Mar-May	Class III-IV	Yes	1	25
N. Fork American ³	Apr-June	Class III-V	No	1	8
Yuba ³	Apr-June	Class III-V	No	1-2	28
Mid. Fork American ³	Apr-July	Class II-IV	Yes	3	24
Mid. Fork Feather ³	Apr-Sept	Class IV-V	Yes	3-5	32

¹Sources: Klamath Falls, 1986.
Interagency Whitewater Committee, 1985.
Deschutes National Forest, 1988.
Mt. Hood National Forest, 1989.
Tahoe National Forest, 1989.
Plumas National Forest, 1989.
Umatilla National Forest, 1989.
FERC Draft Environmental Impact Statement, 1989.

²In the region of Klamath, Jackson, Josephine, and Douglas counties in Oregon and Siskiyou County in California.

³Outside the region

Table 2-5. Whitewater Classification on the Upper Klamath River

River Section	Number of Rapids				
	Class I'	Class II'	Class III'	Class IV'	Class V'
RM 220.1 - RM 214.3 (Boat launch area to Caldera Rapid)	14	9	1	0	0
RM 214.3 - RM 209.3 (Caldera Rapid to state line)	1	9	13	3	2
RM 209.3 - RM 204 (State line to upstream of Access #1)	13	7	2	0	0

'Rapids are given a difficulty rating of I to VI on the International Scale of River Difficulty, shown below.

CLASS I EASY

Moving water with a few ripples and small waves. Few or no obstructions.

CLASS II EASY TO MEDIUM

Rapids with waves up to three feet, and wide clear channels. Some maneuvering is required around obvious obstacles.

CLASS III MEDIUM TO MODERATELY DIFFICULT

Rapids with high irregular waves, narrow channels, rocks, and holes. Often requires complex maneuvering.

CLASS IV DIFFICULT TO VERY DIFFICULT

Long, turbulent rapids with powerful waves and holes. Many obstacles requiring precise, expert maneuvering. Scouting from shore is often necessary.

CLASS V EXTREMELY DIFFICULT

Long, technical, and very violent rapids with highly congested routes which nearly always must be scouted from shore. Dangerous drops, unstable eddies, irregular currents, and horrendous holes are often encountered. Requires experience, self-confidence, and good physical condition.

CLASS VI NEARLY IMPOSSIBLE AND EXTREMELY DANGEROUS

Difficulties of Class V carried to the extreme of navigability. Mishap could be hazardous to life. For teams of experts only, after close study and with all precautions taken. Generally considered unrunnable for commercial purposes.

Source: Headwaters Commercial Outfitters (1989 Brochure).



The first section of the river (RM 220.1 to 214.3) provides Class I to III rapids.

The upper Klamath, lower Klamath, and Rogue rivers are the only rivers in the region (Klamath, Jackson, Josephine, and Douglas counties in Oregon and Siskiyou County in California) that are available year-round for whitewater boating—the upper Klamath River with Class IV-V rapids and the lower Klamath and Rogue rivers with Class III-IV rapids. In the remainder of Oregon and northern California (outside the region), there are no other year-round Class IV-V rapids available; although the Snake River in Oregon offers year-round Class III-IV rapids and the Trinity and South Fork American rivers in northern California offer year-round Class III rapids. The availability of year-round rafting is dependent on controlled flows that are provided by upstream hydroelectric power projects.

Most boating use on the upper Klamath River occurs on weekends from mid-May through mid-September, although some boating use occurs during other months when flows are high. The unique whitewater boating opportunities on the upper Klamath River attract visitors from outside the region who are willing to travel long distances to experience the quality, late-season Class III-V run that is not found on other rivers.

Most of the early-season use is from private boaters, who are predominantly from within the region. Most of the late-season use is from commercial outfitters

due to the lack of comparable whitewater boating opportunities elsewhere. In 1989, 13 of the 19 commercial outfitters were from outside the region, with most of their clientele originating from Oregon and California, and the rest from throughout the U.S. and occasionally from outside the U.S. (Jones 1989 and Munroe 1989, pers. comm.).

Most local private boaters and commercial rafting outfitters spend one day rafting the river. Outfitters from outside the region primarily take two-day trips because the travel time involved makes it difficult to float the entire raftable stretch in one day. For one-day trips, most experienced boaters put in at the BLM launch site (RM 220.1) and take out either at access point #1 (RM 203.7) or Copco Lake Store (RM 203) in California. Occasionally, the experienced boaters will start at Frain Ranch (RM 215) for a shorter, more technical and exciting trip. Inexperienced boaters usually float either from the BLM launch site to Frain Ranch, or from the BLM take-out to Copco Lake because the rapids are less technical. The lower portion of segment 2 is very technical (difficult) with almost continuous rapids, allowing very little time to view the surroundings.

Actual visitor use day (VUD) figures for boating have increased since 1982. Table 2-6 shows the last seven years of VUD for whitewater rafting. The

whitewater rafting use was estimated to be 4,575 VUD in 1988. Based on BLM user counts from 1983 to 1988, use has grown on the river at a rate of 8.3 percent per year. This current growth is due to improvements in whitewater raft technology, the growing popularity of whitewater boating, the relatively recent discovery (1980) of the upper Klamath River as an excellent whitewater resource, and the regional scarcity of comparable whitewater boating opportunities on a year-round basis. The nearest comparable alternative whitewater boating opportunity, the Rogue River, is already approaching its maximum allowable use. Notably, private boating use on the upper Klamath River has increased by an annual average of 60 percent since the BLM began keeping such records in 1986. Particularly valued are the relatively scarce opportunities to run Class IV and V rapids in the middle to late summer. Most boaters (75 percent) indicated in a user survey that if they were unable to float the upper Klamath due to lack of sufficient flows from the J.C. Boyle Powerhouse, they would try to reschedule an upper Klamath River trip rather than float a substitute river (Oregon State University 1990).

Private boaters are not required to obtain a use permit; however, commercial outfitters must obtain annual special recreation permits from the BLM. BLM issued 19 special recreation permits for whitewater rafting and two for related activities (video and still

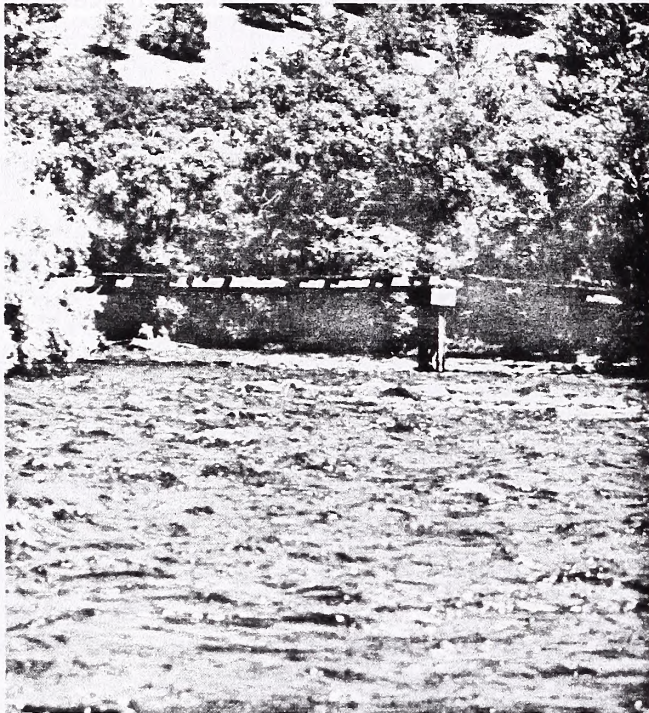
photography) in 1989. In previous years, there have been as many as 64 permittees, although typically not all the permittees actually used the Klamath River.

Fishing. The upper Klamath River, managed as a wild trout river in all three segments, provides an excellent trout fishery and is among one of the better fly fishing rivers in Oregon. The Klamath Basin provides a wide variety of angling opportunities, but only the upper Klamath River provides virtually unlimited river access and an excellent catch rate for large wild rainbow trout on a major river. It is rivaled in Oregon only by the Deschutes River. Currently, the upper Klamath, Rogue, and lower Klamath are the only major rivers in the region (Klamath, Jackson, Josephine, and Douglas counties in Oregon and Siskiyou County in California) that are open to trout angling year-round. The Pit and Trinity rivers, outside the region in California, also provide year-round trout angling opportunities.

Spring comes early to the upper Klamath River Canyon, providing the earliest angling opportunity for a river fishery in Klamath County. The majority of fishing use occurs during spring and fall. Most anglers in the canyon are residents of nearby communities, who usually come to fish for one day. The river's reputation for producing large wild rainbow trout draws anglers from outside the region who come



With a drop of 77 feet per mile, the second section of the river (RM 214.3 to 209.3) are continuous Class III to IV rapids.



The lower section of the river (RM 209.3 to 204) provides Class I to III rapids.

to fish for more than one day. A 1984 creel survey (City of Klamath Falls 1986) indicated that 87 percent of all anglers on the upper Klamath River are from Oregon and the remaining 13 percent are from California.

Hunting. Hunting occurs primarily on open benches along the river and in draws along the canyon rim. Black-tailed deer, silver-gray squirrels, mountain and valley quail, and turkeys are hunted, usually on weekends during the scheduled seasons. Most hunters in the canyon are residents of nearby communities who come to hunt for one day or more. In Oregon, hunting is regulated by the Oregon Department of Fish and Wildlife (ODFW), and in California, by the California Department of Fish and Game. Accurate hunter use figures are not available at this time.

Camping. The remote Klamath River Canyon offers campers a semi-primitive experience. This experience is more primitive below (downstream from) Frain Ranch than above. The opportunity for isolation from the sights and sounds of people is a characteristic feature of the canyon that campers enjoy. Camping occurs either at Frain Ranch, on BLM designated

Table 2-6. Upper Klamath River Use Statistics for Whitewater Rafting

	1982	1983	1984	1985	1986	1987	1988
Commercial Comparisons							
Number of Trips	170	119	141	140	135	222	247
No. of Passengers	1,560	1,130	1,184	1,217	1,751	2,163	2,621
User Days	2,623	2,132	2,144	2,072	3,484	3,375	3,957
Average Number of Passengers per Trip	9.0	9.5	8.4	8.7	13.0	9.0	11.0
One Day Trips	67	25	50	52	78	129	143
Two Day Trips	98	90	84	86	56	92	104
Three Day Trips	5	4	6	2	1	1	0
Four Day Trips	0	0	1	0	0	0	0
Permittees	68	41	22	23	30	25	23
Active Companies	27	27	20	22	20	21	20
Private Comparisons							
Number of Trips	60	35	43	56	39	45	75
Number of Passengers	179	164	291	287	210	291	450
User Days					242	343	618

Note: Figures are shown only to depict trends in use. Use figures are lower than the actual use on the river because a self registration system is used and the table does not reflect those who do not register.

sites, or on upland benches along the roads, usually by commercial whitewater boaters and anglers in the summer. Most outfitters providing two day trips camp either at Frain Ranch or upstream on BLM designated sites. These sites provide the last streamside access with open benches for camping before entering the long, steep, rugged, and narrow section of river. Support vehicles can drive to these areas and establish camp, which contributes to a safer raft trip with less weight in the rafts. Some camping occurs in the spring and fall, primarily by those who are hunting and fishing.

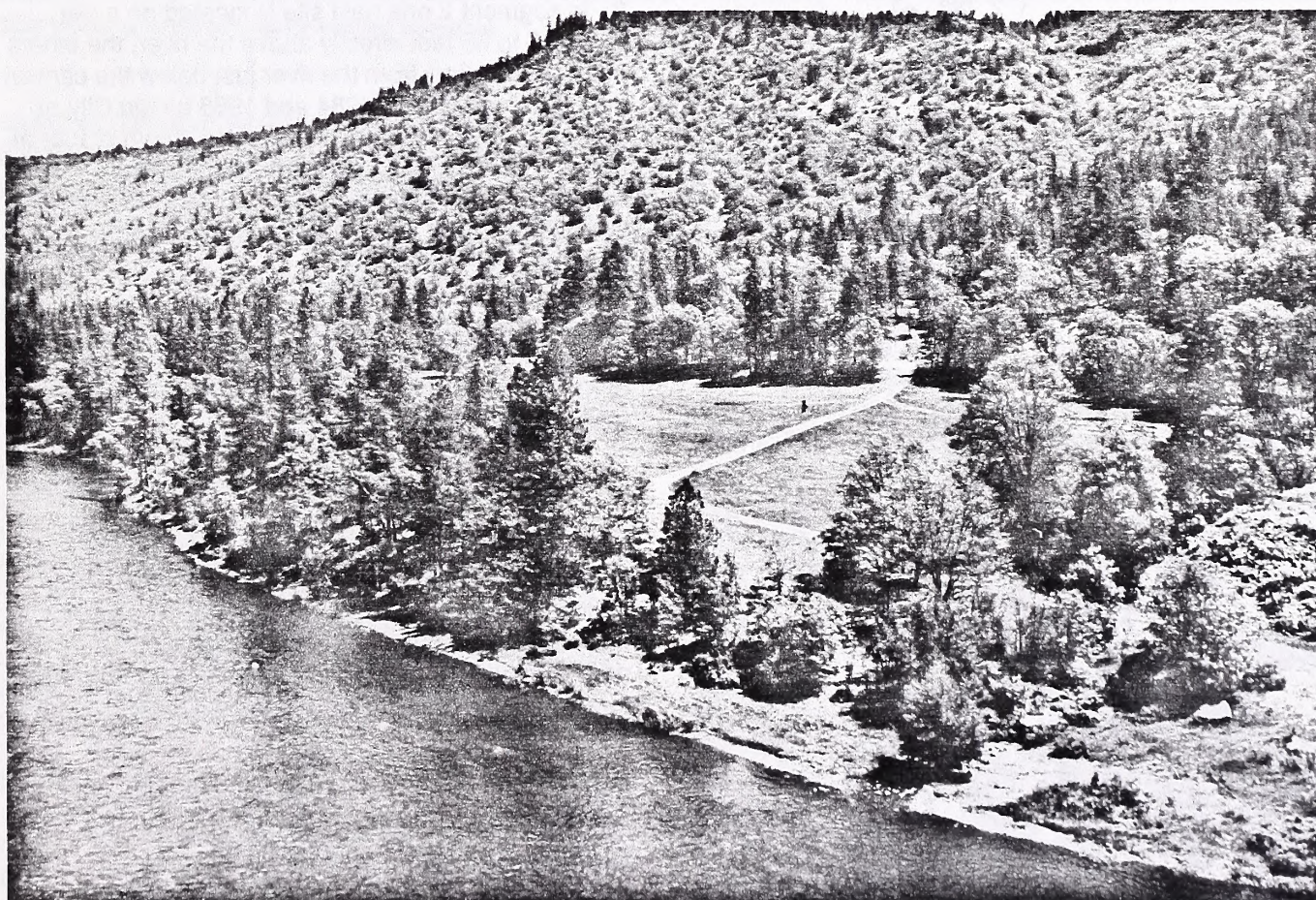
Recreation Sites and Facilities. Public recreation sites and facilities are scattered throughout the study area (map 2-3). A BLM raft launch facility with toilet, message board, and registration drop box is at RM 220.1, approximately 1/4-mile below the J.C. Boyle Powerhouse. No overnight parking is allowed. Approximately three miles below the boat launch area are two semi-primitive campsites with tables and fire pits. Six additional fire-safe sites are available along the river's edge down to approximately RM 216. There are several primitive campsites at Frain Ranch. No recreational access or facilities are provided from approximately RM 214.3 to the Oregon-California

state line. A BLM raft take-out area and two toilets are provided at RM 209.1, just downstream of the state line. PP&L provides fishing access on private land through five gated entrances along Topsy Road in segment 3 with parking space, toilets, and message boards.

Wildlife

The diverse plant communities found in the upper Klamath River Canyon provide a great variety of wildlife habitats and wildlife species. Historical use of the upper Klamath River Canyon included timber harvesting, livestock production, and homesteading; the canyon was also used as a major travel route. Despite this historical use and the current hydroelectric developments and recreation activities, the canyon remains relatively remote and undisturbed and with the surrounding sparsely settled forests and rangelands provides the habitat quality needed by the many species of wildlife found in and around the canyon.

The diverse terrestrial habitat within the study area supports a large number of wildlife species. In addition, several other species of wildlife are found in



The Frain Ranch with open, flat terrain and river access makes it attractive for camping.

the surrounding environment that either reside within the study area or use canyon habitat to some extent, including at least 98 birds, 28 mammals, and 15 reptiles and amphibians (herptiles) (appendix B).

Birds. Of the 98 known species of birds within the study area, some reside year-round and others are seasonal or migratory. There are at least 16 known species of raptors, 8 species of waterfowl, 8 upland gamebirds, and 66 non-game birds.

Because the Klamath River Canyon cuts across the Cascades, it is a natural migration corridor. The extensive rimrock, cliffs, and large pines in the canyon provide an abundance of nesting substrate for raptors. Osprey, bald eagle, prairie falcon, and American kestrel are known to nest in the canyon.

The fish inhabiting the Klamath River provide a good prey base for bald eagles and osprey that forage in

the canyon. At least one pair of bald eagles (Federal and Oregon State listed threatened, California State listed endangered) may be year-round residents of the canyon. This pair has nested in the canyon each year since 1979 and, except for two years, has successfully fledged young (Isaacs and Anthony 1988). The nest is located within segment 2, approximately 1,500 feet from the river. Another pair nests outside the study area, 1.8 miles from the J.C. Boyle Dam, and likely forages in J.C. Boyle Reservoir and in segments 1 and 2. This nesting pair was discovered in 1983 and has continued to nest in the vicinity. Both pairs nested in 1989. Migrating and wintering bald eagles are also found in the canyon.

Ospreys nest in the study area and generally use the tops of large snags or live trees adjacent to the river for nest and perch sites. These birds are commonly seen foraging up and down the river. At least one pair has nested in recent years, including 1989, at one of two known nest sites adjacent to the river within segment 2. Another nest is located next to the river about 1/4-mile downstream of the study area in segment 3.

Six known prairie falcon nest sites occur in the study area, one in segment 1 and the remainder in segment 2. In segment 2 one nest site is located on a cliff ledge 35 to 45 feet directly above the river, the others are on cliffs away from the river just below the canyon rim. Surveys done in 1984 and 1985 by the City of Klamath Falls (1986) show that a maximum of four of these were occupied. Although nesting was not confirmed, field observations by BLM in 1989 showed two pairs present and exhibiting nesting behavior at two nest sites in segment 2.

American kestrels, commonly found in summer, are known to nest in the study area. A survey by the City of Klamath Falls (1986) showed at least four pairs of nesting kestrels.

Other raptors found in the study area include the red-tailed hawk, sharp-shinned hawk, Coopers hawk, great horned owl, long-eared owl, and western screech owl. The northern goshawk and northern pygmy owl are two Oregon State sensitive species that exist in the study area and potentially nest in or near the canyon. Golden eagles are commonly seen foraging in the canyon and are known to nest near the study area.

The peregrine falcon, a Federal and Oregon and California State listed endangered species, historically nested in the canyon, but nesting has not been known to occur since the early 1970's. Peregrines are known to migrate through and winter in the canyon



Osprey nest in segment 2.



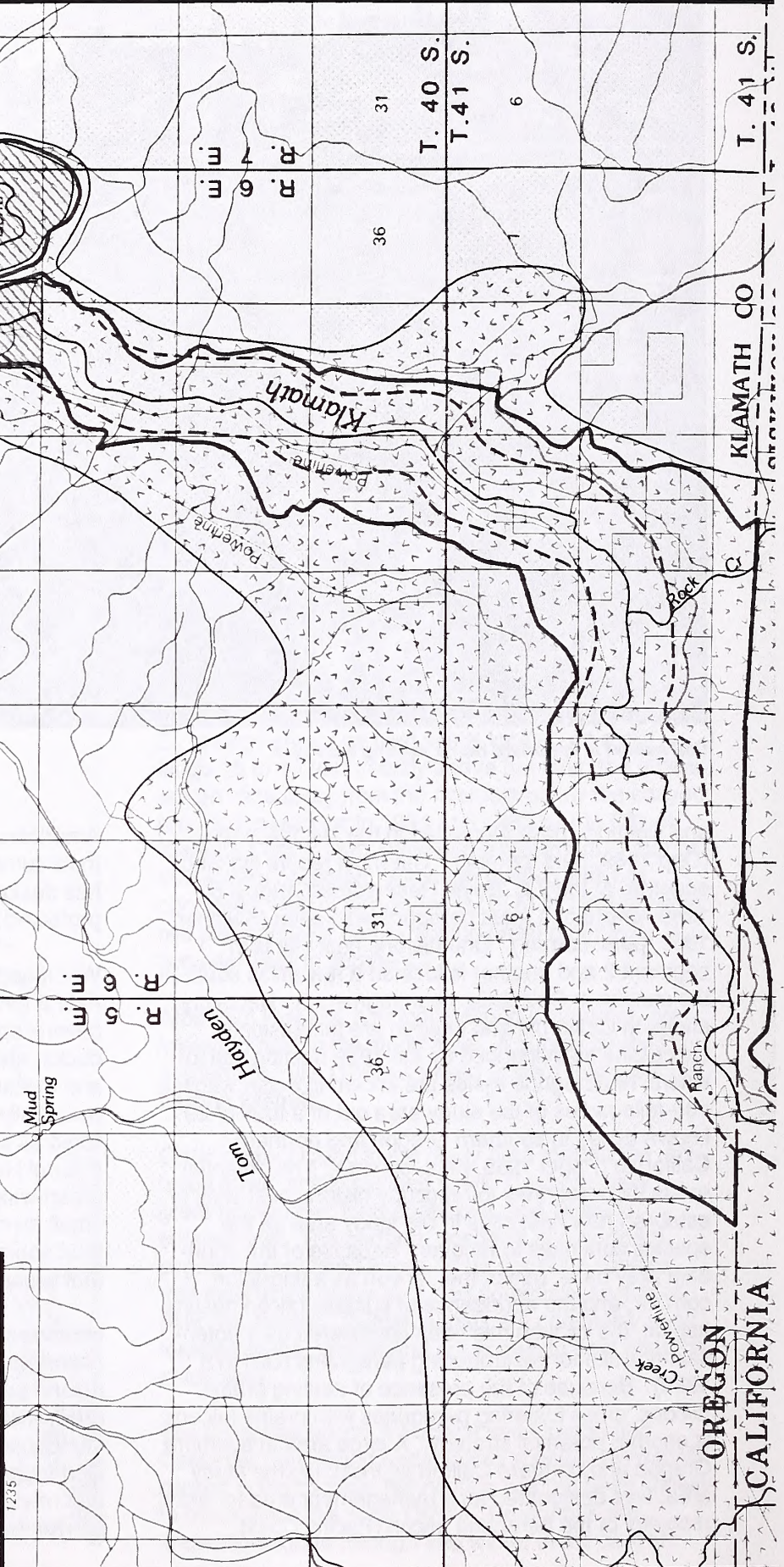
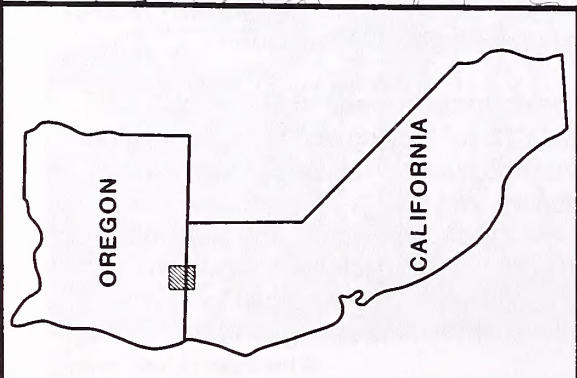
Cliff habitat is important raptor nesting substrate.

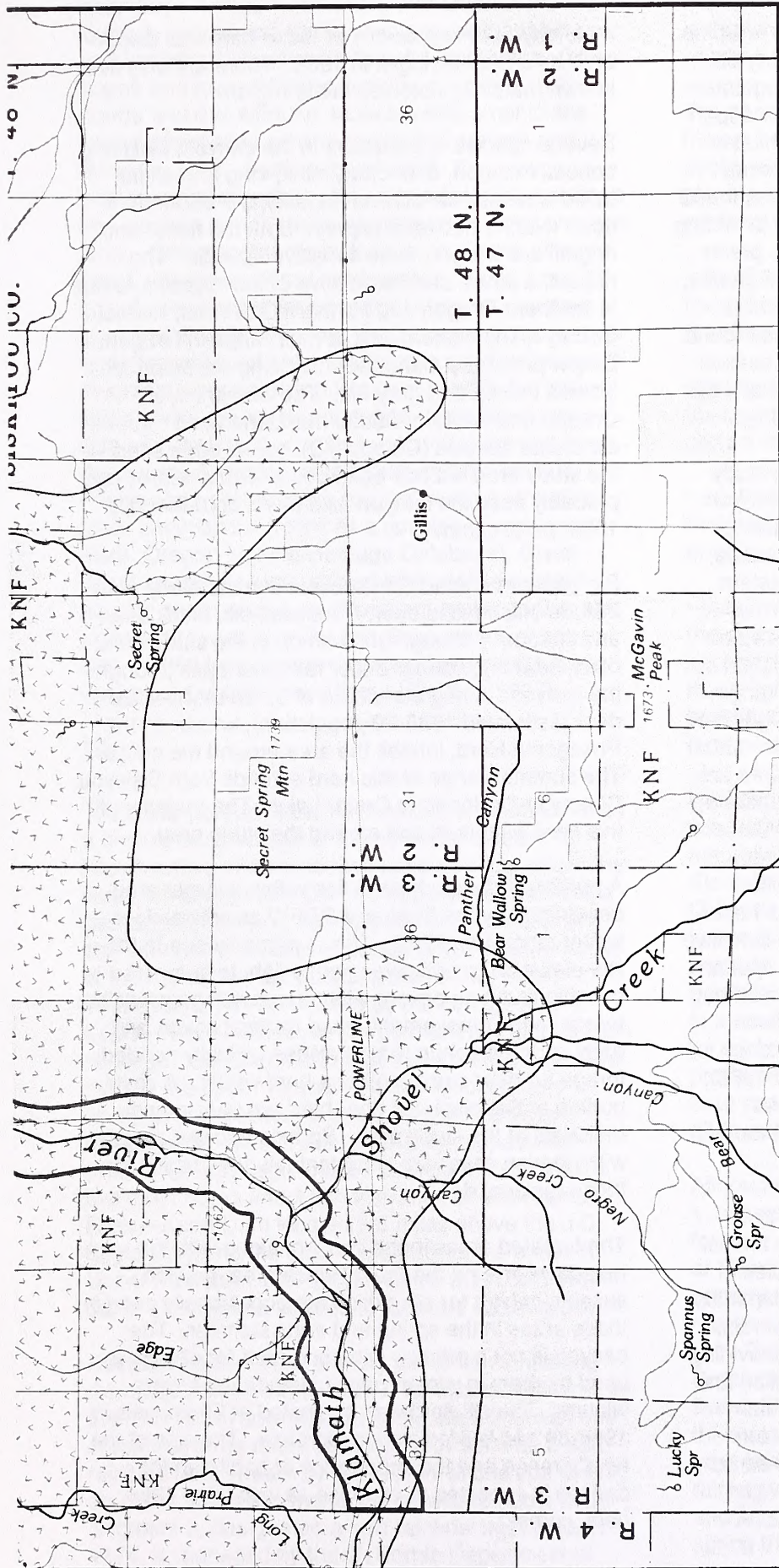
and sightings have increased in the last few years (Opp 1989, pers. comm.). The most recent sighting occurred at the J.C. Boyle Reservoir on August 5, 1989, where one adult peregrine was seen (Swisher 1989, pers. comm.). One historic nest site is in segment 2 and another is located a few miles south of the canyon in California, near segment 3. Recovery efforts in California and Oregon are increasingly successful as evidenced by the 1989 nesting season where 14 peregrine eyries are known to occur within a 100-mile radius of the study area out of a total of 29 known eyries in southern Oregon and northern California (Pagel 1989, pers. comm.). The potential exists for peregrines to reoccupy historic nest sites or establish new nest sites in the study area as the species continues to recover. Because of the abundant prey base, use of the canyon as a migration corridor, and the abundance of suitable falcon nesting habitat, the canyon has been considered as a potential hack site for reintroducing peregrines (USFWS 1989). Because of the presence of nesting prairie falcons, cross fostering peregrines with prairie falcons is another potential strategy. A large area in southern Oregon and northern California, including the study area, was designated as a management area for the recovery of the peregrine falcon (Pacific Coast

American Peregrine Falcon Recovery Team, 1982). In its current management framework plan, the BLM has designated a portion of the cliffs in segment 1 as protected habitat for falcons (map 2-5).





Wet meadows adjacent to slow moving portions of the river provide feeding, resting, and nesting habitat for several species of waterfowl. Canada geese, wood ducks, and common mergansers are known to nest, and mallard, cinnamon teal, and Barrow's goldeneye, potentially nest along the river. Barrows goldeneye is listed as a species of concern in Oregon (Oregon Natural Heritage Database 1989). Tundra swans and green-wing teal also use river habitat. The many small minnow-like fish found in the river provide a food source for the double-crested cormorant, a bird that is common throughout the canyon.

Meadows, oak grasslands, and dense brush are important habitats for feeding and brood rearing of upland gamebirds such as California and mountain quail, wild turkey, and chukar. The latter two were introduced into the canyon in the 1950's and 60's. Red-legged partridge, a species similar in appearance and related to chukar, were introduced into the canyon by the ODFW in the spring of 1989. Although





LEGEND

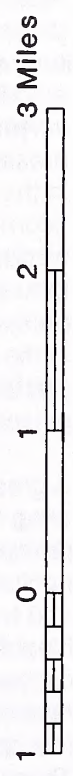
-  Critical Deer Winter Range
-  BLM Designated Falcon Habitat
-  Study Area Boundary
-  Oregon State Scenic Waterway



MAP 2-5

UPPER KLAMATH RIVER CRITICAL DEER WINTER RANGE AND FALCON HABITAT

March 1990



ruffed grouse historically inhabited the study area, no recent sighting records exist. This grouse may be present in areas that contain moist woody vegetation near springs and seeps or areas near the few aspen stands found in the canyon. This type of habitat is very limited within the canyon and likely limits the presence of ruffed grouse. The abundant oaks found in the study area are important to turkeys by providing acorns—a crucial food source. Turkeys also prefer wooded meadows adjacent to the river. Blue grouse, mourning dove, and band-tailed pigeons are also present in the study area. All of the gamebirds found in the study area are open to hunting during season and all are permanent residents, except the band-tail pigeon and mourning dove, which are migratory.

A great variety of non-game birds inhabit the study area. The diverse plant communities in the canyon provide important nesting, foraging, and wintering habitat to many birds. Robins, juncos, chickadees, and two Oregon State sensitive species—western bluebirds and acorn woodpeckers—winter in the canyon in large numbers. Acorn woodpeckers also nest in the study area and are the only population of this species that nests east of the Cascade Range. These and other non-game birds provide a significant prey base for raptors and predatory mammals. Other State sensitive species inhabiting the study area are Lewis' and pileated woodpeckers (Oregon sensitive), and the bank swallow (Oregon sensitive and California threatened). Most of these species also nest within the study area. The Western yellow-billed cuckoo potentially occurs in the canyon. This Federally listed Subcategory 3B and Oregon State sensitive and California State threatened bird inhabits riparian areas found in interior valleys west of the canyon but has been sighted in the past throughout eastern Oregon and may occur in the study area, although its presence hasn't been documented (Littlefield 1988). Vaux's swift, listed on the 1989 Oregon Natural Heritage Database Review/Watch List, is common in the study area.

Mammals. The canyon provides the habitat to support a great variety and abundance of mammals. Silver gray squirrels, an important game species in the canyon, are plentiful as are other small mammals such as bats, rabbits, chipmunks, ground squirrels, deer mice, shrews, and other small rodents, providing an abundant prey base for the many mammalian and avian predators. Beaver and muskrat, two small mammals dependent on aquatic habitat, are commonly found along the river. Townsend's big-eared bat, a Federal candidate (Category 2) and Oregon State sensitive species, is found in segment 2. A

maternity (birthing) colony of these bats was discovered by a BLM biologist in 1988. There are only five known maternity colonies in the region.

Several species of predators in the canyon, including bobcat, raccoon, river otter, mink, long and short-tailed weasels, fisher, and ringtails, are dependent upon riverine habitat and prey. Both the fisher and ringtail are Oregon State sensitive species. The ringtail, a small, slender relative of the raccoon, is rare in southern Oregon and northern California; Klamath County is the eastern limit of their range in Oregon. Larger predatory mammals inhabiting the study area include coyote and gray fox. The wolverine, an Oregon and California State threatened and Federal candidate species (Category 2), hasn't been seen in the study area but has been documented nearby and probably uses the canyon as a travel corridor (Opp 1989, pers. comm.).

Big game mammals that occur within the study area include black-tailed deer, Roosevelt elk, black bear, and cougar. Although uncommon in the study area, black bear and cougar either reside or pass through the canyon. A migratory herd of 3,100 black-tailed deer (estimated 1988-89 population), known as the Pokegama Herd, inhabit the area around the canyon. The summer range of this herd extends from Siskiyou County in California to Crater Lake. The majority of this herd winters in and around the study area.

A portion of the study area lies within a larger area designated by the BLM and ODFW as critical deer winter range (map 2-5). This is primarily due to the low elevation, which gives rise to light to snow-free conditions during severe winters, providing accessible forage, easier movement, good thermal cover, and early spring greenup that furnishes critically needed forage for deer coming off of a hard winter. A small portion of this black-tail deer herd are year-round residents of the study area. Springs and wet areas with riparian cover are important fawning habitat for these resident deer.

The forested areas in the canyon, along with the meadows around the Frain Ranch area, provide suitable habitat for elk, which are occasionally seen in these areas in the spring and early summer. The canyon is not a primary wintering area for elk, but is used by them in winter, particularly during severe winters. The elk herd was estimated at 50 animals in 1988-89 and is predicted to increase. The size of the herd's range and the importance of habitat in the canyon is expected to increase as well (Opp 1989, pers. comm.).

Herptiles. A variety of reptiles and amphibians are found in and around the study area; a total of 28 species potentially occur within the study area. Talus slopes and rocky hillsides provide good habitat for lizards and den sites for snakes, while amphibians inhabit moist sites around seeps and springs and along the river. Snakes found within the canyon include western rattlesnake, ringneck snake, common and western garter snake, gopher snake, and western racer. Common lizards include fence lizard, alligator lizard, sagebrush lizard, and western skink; amphibians of note include long-toed salamander, western toad, and Pacific tree frog. Two Oregon State sensitive species found in the study area are the California mountain kingsnake and Western pond turtle, the latter is also a Federal candidate (Category 2) species. Species that potentially occur but haven't been documented as present in the study area include Pacific giant salamander, roughskin newt, ensatina, black salamander (listed as a species of concern in 1989, Oregon Natural Heritage Database), Great Basin spadefoot toad, striped whipsnake, western aquatic garter snake, northwestern garter snake, and night snake; and four Oregon State sensitive species—tailed frog, western spotted frog, sharptail snake, and short-horned lizard (St. John 1987).

Fish

The study portion of the Klamath River is inhabited by a diverse assemblage of fish species; at least 15 known native and introduced species occur within the study area (appendix C). Historically the river was a passageway for anadromous fish (chinook salmon and steelhead) as they migrated to various tributaries of the Klamath River and Upper Klamath Lake. These fish runs were halted by the construction of Copco I Dam in 1918, which permanently blocked fish passage. Subsequent to this, three more dams were built on the upper Klamath River—Copco II and Irongate in California, and J.C. Boyle in Oregon, completed in 1925, 1938, and 1958, respectively (map 1-1). Although located outside the study area, two other dams affect fish migration on the Klamath River—Keno Dam located 8.5 miles above the J.C. Boyle Dam and the Link River Dam at the outlet of Upper Klamath Lake. Boyle, Keno, and Link River dams all have fish ladders to facilitate fish migration.

Rainbow trout are the primary game fish inhabiting the study portion of the river. The Klamath River from the Keno Dam downstream to the state line was one of the first three rivers designated in 1978 as a wild rainbow trout stream by the ODFW and is one of only six rivers in Oregon managed for wild rainbow trout. Segment 3, designated a wild rainbow trout area in 1974, is managed by the California Department of

Fish and Game. No hatchery fish have been stocked in the Oregon reach of the Klamath River since 1978 or in the California reach since 1974.

The concern and importance of this wild rainbow trout fishery has been acknowledged not only by State designation, but by public and private concerns and also by State and Federal government agencies as evidenced by the following:

- the National Park Service, in its Nationwide Rivers Inventory, recognized the "excellent trout fishery" of the Klamath River;
- the Northwest Power Planning Council designated the upper Klamath River as a Protected Area to protect the resident rainbow trout population;
- the Pacific Northwest Rivers Study for Oregon gave their highest resource value rating based on the wild trout population;
- the Oregon Department of Fish and Wildlife chose the wild rainbow populations of the Klamath Basin, specifically those of the Klamath River, as the first of many in the state to be studied to better understand how stocks of wild trout have adapted to their particular environments.

Wild rainbow trout of the Klamath River are a highly productive, self-sustaining population that spawn naturally in the wild. Studies done by the City of Klamath Falls (1986) estimated rainbow populations (7.8 inches or larger) between the J.C. Boyle Powerhouse and the Frain Ranch area (RM 214) at 890 fish per mile, and between RM 214 and 210 at 1,911 fish per mile. These population estimates are comparable to a similar river, the lower Deschutes River, managed for wild rainbow trout and noted as one of the most productive streams in Oregon, where the wild rainbow trout population was estimated at 1,500 per mile (Griggs 1989, pers. comm.).

Although some spawning habitat is found in segment 1, segments 2 and 3 have little or no spawning habitat for trout. Most adults migrate to either Spencer Creek or Shovel Creek to spawn. Spencer Creek, the primary spawning tributary for trout in the upper reaches of the river, empties into J.C. Boyle Reservoir. Trout migrating from the study reach to Spencer Creek must pass over a fish ladder at the J.C. Boyle Dam. Shovel Creek, three miles downstream from the state line, is the primary spawning tributary for trout in the lower reaches of the river. Klamath River rainbow trout spawn from early March through May, and juvenile fish begin to migrate into the river from spring through fall (Fortune 1989, pers. comm.). After

the high spring flows have dropped off, the flow is relatively stable in segment 1 from summer through winter. This reach of the river is an important rearing area for trout in their first year of life.

The Klamath River produces an immense quantity of aquatic invertebrates. The abundance of these aquatic insects—caddisflies, mayflies, and stoneflies—in the river provide a primary food source for trout. Crayfish are abundant and are also an important part of the trout's diet.

Klamath River wild rainbows are genetically unique in their resistance to periodically high pH values. It is likely that their resistance to a fatal protozoan parasite and high water temperatures are also unique genetic traits, but could be environmental adaptations (Buchanan 1989, pers. comm.). The ODFW is undertaking studies of the Klamath River rainbow population to determine if these traits are environmental or genetic. Although other Oregon river systems contain native rainbow trout that are resistant to high water temperatures and the protozoan parasite, non-native strains of rainbows historically introduced into the Klamath apparently were not able to reproduce due to their susceptibility to the parasite (Buchanan 1989, pers. comm.). Klamath River rainbows confront other problems including low summertime flows, high summertime water temperatures and concurrent decreasing water quality, lack of spawning gravel, cyclic water fluctuations from power generation, and competition from non-native warmwater fish. Despite these problems, Klamath River rainbows have been able to reproduce and sustain a productive fishery that is popular and has high catch rates of trout up to 20 inches.

The study portion of the Klamath River in Oregon is managed as a catch and release fishery from June to September and is open to a limited catch the remainder of the year. The palatability of the trout meat decreases as a result of the poor water quality conditions that occur at this time of the year primarily due to the high water temperatures and high algae content from the massive blooms in upstream impoundments.

Two Federal and Oregon and California State listed endangered species, the Lost River and shortnose suckers, occur in the study area. The Lost River sucker, or "mullet", once an important food staple for local Native Americans, was at one time abundant in Klamath Basin lakes and streams, migrating by the thousands to spawn in tributaries of Upper Klamath Lake. Lost River and shortnose suckers typically inhabit lakes and migrate into tributaries to spawn. The Lost River and shortnose sucker are found in J.C.

Boyle Reservoir, Copco Reservoir, and in segment 3. Although these two endangered species have not been found in segments 1 and 2, it is very probable that they enter this part of the river when washed over J.C. Boyle Dam during high flows.

Other native species found in the river include Klamath smallscale sucker, blue and tui chub, marbled sculpin, and Pacific lamprey. The Klamath largescale sucker (Federal candidate, Category 2 species), has been found in J.C. Boyle Reservoir and potentially occurs in the study area. Several introduced minnow-type species occur in the river. Golden shiner, Fathead minnow, and Sacramento perch are lake dwellers and generally are not found in swift flowing portions of the river, though they may occur in slack-water close to Copco Reservoir. Although not documented, there have been at least two reports of white sturgeon in the study area. White sturgeon were planted in Upper Klamath Lake in the 1950's. Brown trout, planted in Copco Reservoir, inhabit and migrate through segment 3 to spawn in Shovel Creek. Steelhead, planted into Copco Reservoir 1971-1981 (excepting 1975, 1977, and 1978) have been reported from the California portion of the Klamath in the past. A cooperative effort between California Department of Fish and Game and a private organization exists to raise and plant native stocks of rainbow trout into Shovel Creek.

Cultural

Cultural resources within the study area are divided into three categories, prehistoric, historic, and current Native American traditional use. Prehistoric resources are associated with Native Americans and date before the time of contact with European settlers (AD 1850). Information about these resources is recovered through scientific archaeological investigations. Historic resources date after AD 1850 and are more than fifty years old. In the study area they are associated with early stagecoach and freight travel, early ranching activities, logging activities, and in one case, sacred use by Native Americans. There are no known cultural resources in the study area between the J.C. Boyle Dam and Powerhouse. Current Native American cultural and spiritual practices within the study area are described in the Land Uses section of this chapter.

Prehistoric. Archaeological surveys, excavations, and artifact analyses have been conducted within the study area over the last 28 years. Initial investigations by the University of Oregon in the early 1960's were prompted by the construction of the J.C. Boyle Powerhouse and Dam. More recently, as part of the proposed Salt Caves hydroelectric project, the City of

Klamath Falls (1984-1986) surveyed land and test excavated 20 sites within the study area. In 1989, 750 acres of BLM-administered land in the study area were surveyed (Class III - Intensive Field Inventory) by the BLM. The BLM also initiated a contract in 1989, in which information recovered during the past 10 years from sites in the canyon was integrated and consolidated with data from the 1960's, into a single, cohesive framework (Mack 1983) for planning and management purposes. Surveys, excavations, and analyses have provided information about prehistoric use of the study area; however, problem-oriented research will yield more in-depth details about prehistoric activities in the canyon. Consultation with Native Americans can also yield information on the prehistory of the study area and its relation to the lives and culture of living people, and enhance the scope of our understanding of the prehistoric use of the canyon.

Forty-five prehistoric sites have been located in the upper Klamath River Canyon (appendix D). These sites consist of pit house villages, stone rings, lithic scatters, burial sites, a quarry site, and a rock shelter. The wide variety of known sites present within the river corridor demonstrates intense prehistoric use of the canyon by Native Americans. Use of the canyon by Native Americans dates back to at least 5000 BC; however, archaeological data (radiocarbon dates, time-sensitive projectile points, and pottery) indicates that most of the sites within the study area were occupied from AD 250 to AD 1800—Late Prehistoric Period (Mack 1989). The wide diversity of riverine-associated plants and animals, the trade and communication corridor provided by the river, and the relatively mild winter climate within the canyon are just a few of the factors which explain the concentration of prehistoric sites in the study area.

The diversity of site types in the canyon and archaeological evidence of the prehistoric diet indicate that the upper Klamath River Canyon was occupied year-round from at least AD 900 until approximately AD 1800 (Mack 1989). Present are fishing, gathering and hunting camps and pit house villages. Using ethnographic accounts (Silver 1978), the pit house villages have been interpreted as winter villages, while the lithic scatters (concentrations of flaked stone debris and tools) are viewed as fishing, gathering, or hunting camps—depending on location—used in the spring, summer, and fall. It is apparent that the large diversity of plant and animal resources in the canyon allowed year-round use of the canyon, rather than only seasonal use as is common for most of the riverine areas of the region. The desirability to occupy a river corridor on a year-round basis was an uncommon occurrence in this region, where the distribution of plant and animal resources is usually

over a wide area, necessitating the seasonal movement of people from place to place. Archaeological analysis has shown that the prehistoric diet included the use of fish, acorns, large and small mammals, turtles, birds, and various plants.

Due to the biological diversity of the canyon, resources were readily available within the study area during different seasons of the year—anadromous fish in the spring and late summer; turtles in the spring, summer, and fall; acorns in the fall; and large game being taken primarily in the fall (Mack 1983). In addition to the sites found within the canyon, sites that are easily accessible from the canyon have been found in areas where roots, seeds, and berries are available. These sites show that resource areas adjacent to the canyon were also used prehistorically as a way to increase and supplement the Native American subsistence base.

Ethnographic accounts (Silver 1978, Spier 1930, Kroeber 1925) and artifacts recovered from sites within the study area indicate the area was used by a variety of cultural groups at different times. These groups have been identified as the Shasta Indians of northern California, the Modoc and Klamath Tribes of the Klamath Basin, the Takelma of the upper Rogue River, and possibly the Pit River Indians of northeastern California. Common to all of these tribes was the use of winter pit house villages, hunting and fishing camps, and a subsistence pattern in which anadromous fish, acorns (where available), large and small mammals, and various plants were major parts of their diet.

Cultural differences between these tribes are largely attributed to their geographic position and the influences of tribes from outside of this region. These cultural differences resulted in the use of distinctive artifact forms, including projectile points, groundstone, and pottery, by each tribe. Pottery recovered at site 35KL16 suggests that this site was occupied by the Takelma, prior to its use by the Shasta. Burials and flaked stone tools show that some of the sites within the southern portion of the canyon were used by the Shasta. Projectile point types also indicate that the Modoc, Klamath, and possibly the Pit River Indians used sites within the canyon. The wide range of artifacts from sites in the study area shows that use of the canyon by different tribes changed over the last 2,000 years. This is important because it shows that territorial boundaries between the different tribes using the canyon did not remain the same through time (an assumption often made about the boundaries of prehistoric culture areas), but changed as each group expanded or decreased its tribal area.

Archaeological investigations over the last three decades in the upper Klamath River Canyon has provided information about prehistoric use of the canyon, as well as the region. Excavations at ten of the pit house village sites have yielded information about the prehistoric diet, burial practices, architectural features, and aspects of tool manufacturing and use. Several of these sites are very large and, with problem-oriented research, should provide more detailed information about prehistoric use of the canyon than is available at present. Tribal boundary fluctuations, trade of raw material and finished products, and a greater understanding of the early use of the canyon are just a few of the research questions that could be pursued by additional research in the canyon. The archaeological data from sites within the canyon make all sites eligible for nomination to the National Register of Historic Places as an Archaeological District. Sites are eligible for nomination to the National Register if they have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4d).

Historical. After the 1850's, Native Americans continued to use the canyon for hunting, fishing, gathering, spiritual purposes, trade, and intertribal communications; but due to encroachment by Euro-americans, their activities were not as prevalent as in prehistoric times. Ethnographic and Euro-american historic accounts (see Theodoratus et al. 1989) present only a generalized level of information concerning historic use by Native Americans. Consultations with Native Americans yield a different perspective on historic use of the area. This perspective reflects a continuous link between prehistoric and historic cultural and spiritual uses—a linkage that has continued into the present; tying the lives of members of the Klamath Tribe and Shasta Nation with those of their ancestors who once inhabited the canyon.

Ethnographic investigations in association with archaeological research (City of Klamath Falls 1985) have identified use of a prehistoric village site (CA SIS 1198) for religious ceremonies associated with the 1870 Ghost Dance, a Native American religious cult which first developed in the early 1870's on the Great Plains and then spread to tribes in the west. Ceremonies were conducted so the deceased would return to the earth and help the living Native Americans regain control of their destiny. This religious doctrine was apparently transmitted from the Klamath Tribe, down the Klamath River, to the northern California tribes (Spier 1927). This Ghost Dance site was probably part of the southward spread of the religion.

The upper Klamath River Canyon has been used extensively by Europeans since the 1850's. The terraces and floodplains along the river and several meadow areas above the river were excellent locations for agricultural and ranching activities. These areas were the focus of European settlers in the canyon, however, the river itself was used to transport logs to mills downstream.

The earliest European explorers in the vicinity of the study area were members of Peter Skene Ogden's Hudson Bay Company expedition of 1826-27. In their search for fur-bearing animals in southern Oregon, Ogden's party traveled along the western canyon rim (within the study area). Unable to access the river because of the steep canyon wall, the explorers left the canyon rim near RM 222.5. Traveling southwest across the Pokegama plateau (the area north of the river) the party again reached the river near Copco Reservoir and continued westward through the Cascade Range (LaLande 1983). Thirty years later Mart Frain, a noteworthy local figure, followed the river northward from the mining town of Yreka, California to the Klamath Basin. Upon reaching the Klamath Basin, Frain began the first trade with local Native Americans. While exploring the southern Cascade Range in the summer of 1888, a prominent regional preservationist, Judge John B. Waldo, and his party travelled through the study area. Journeying northward from Mt. Shasta, the expedition party stayed overnight at the Beswick Resort and Klamath Hot Springs (map 2-6) before continuing up the river to Keno, Oregon (LaLande 1989).

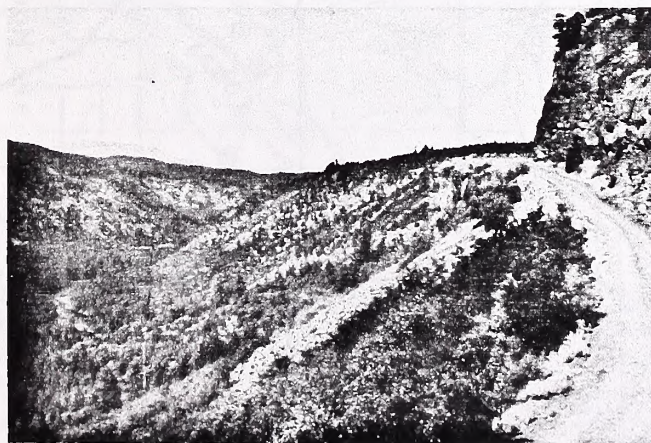
A prominent historical landmark of the study area is a stagecoach/freight road known as the Topsy Road, which parallels the river for 11.4 miles (6.3 miles in segment 3 and 5.1 miles in segment 2) on the south and east side of the river. Bisecting the Cascade Range, this road was officially opened for wagon and stage travel between Yreka, to the southwest, and the Klamath Basin, to the northeast, in 1875. However, as early as 1865, freight for Fort Klamath was carried up the river canyon along a route closely approximating Topsy Road. From 1875 to the early 1900's, when the road to Ashland, Oregon was improved and the railroad reached Klamath Falls, Topsy Road provided the only year-round access to Klamath Falls and to towns east of the Klamath Basin.

Topsy Road underwent three construction periods—initial construction from 1874 to 1875; a second construction period in 1887, when the steepness of the grade was lessened; and the final period of construction in 1890 when Topsy Road and Topsy Grade (where the road cuts into a vertical basalt face) acquired their existing locations. Providing reliable

access during inclement weather between towns west of the Cascade Range and towns on the east side, mail was first carried along this route in 1876. In 1887 all mail to Klamath Falls and towns to the east were routed along Topsy Road. Freight wagons came from Ager, California supplying goods to the Klamath Basin, Fort Klamath, the Klamath Indian Agency, and merchants in Klamath Falls. Stagecoach travel along Topsy Road occurred daily with an overnight stop at the Beswick Hotel and Klamath Hot Springs in segment 3 (map 2-6), and livery stops at the Way Station Ranch (1/2-mile north of the state line in segment 2) and Overton Station, which is above Topsy Grade. Even with the construction of a reliable road from Ashland, Oregon, and access by railroad, traffic continued on Topsy Road after the early 1900's.

The Beswick Hotel and Klamath Hot Springs complex in segment 3 provided a popular overnight stop for the stage passengers and freight drivers, as well as a vacation resort/health spa. The resort had a hotel, post office, store, saloon, swimming pool, restorative hot springs, dance pavilion, stables, and living quarters for employees. In its heyday as a famous spa, the hot springs were visited by such noted guests as President Herbert Hoover, author Zane Gray, and pilot Amelia Earhart. The first Beswick Hotel, constructed around 1870, is still standing. A second hotel, built in 1887, was destroyed by fire in 1915. Stones from the second hotel were used to construct a dance pavilion around 1920; this, too, was destroyed by fire. The post office, store, and saloon, all housed within the same building; swimming pool; stables; and living quarters for the resort employees are still standing today and are visible from the road and river.

Way Station, a livery stable and log cabin, associated with travel on Topsy Road is still standing. The location of Overton Station, another livery stop, is marked by several poplar trees above Topsy Grade.



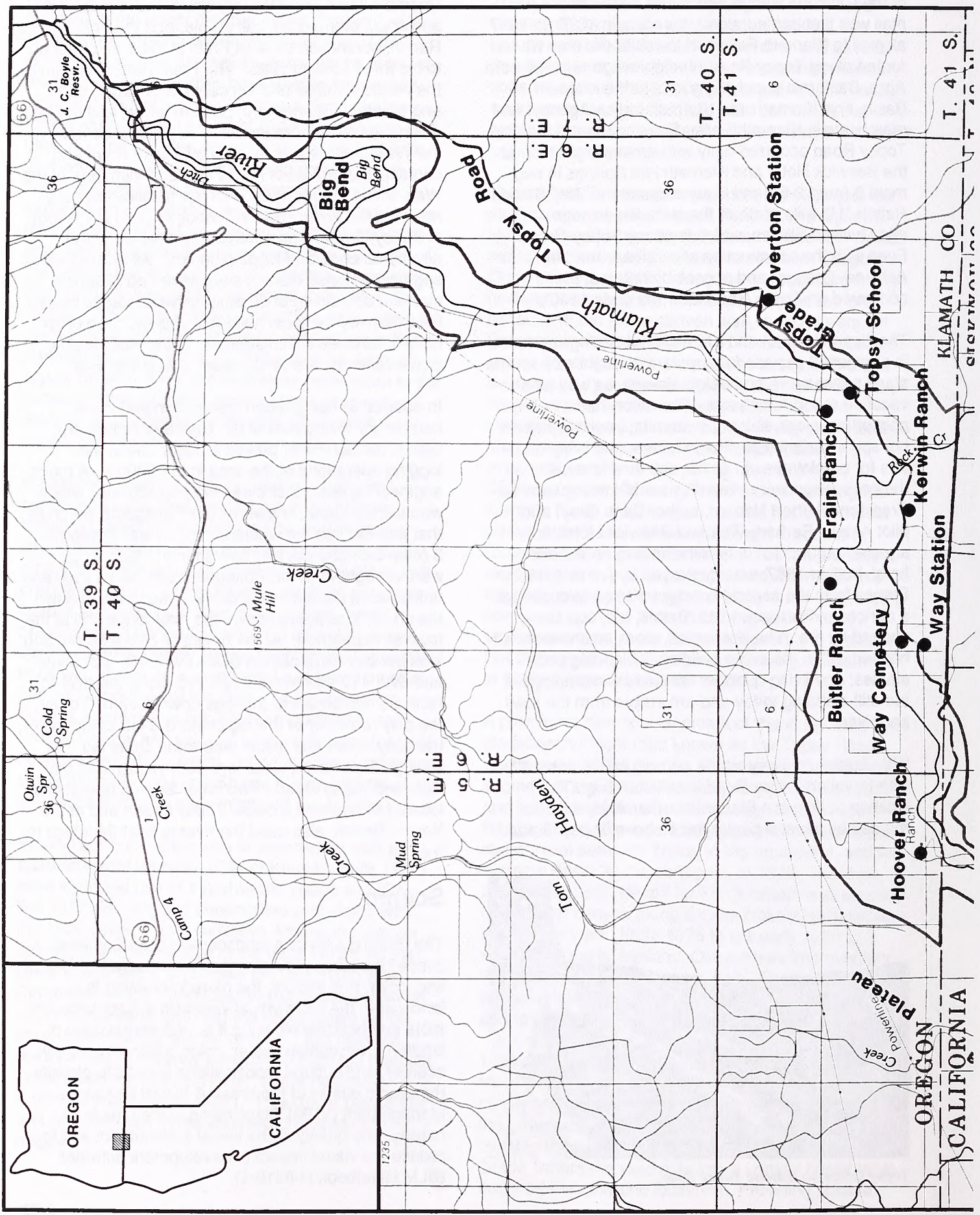
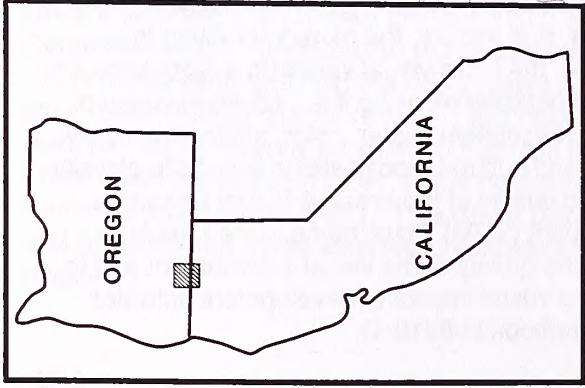
Topsy Grade on historic Topsy Road.

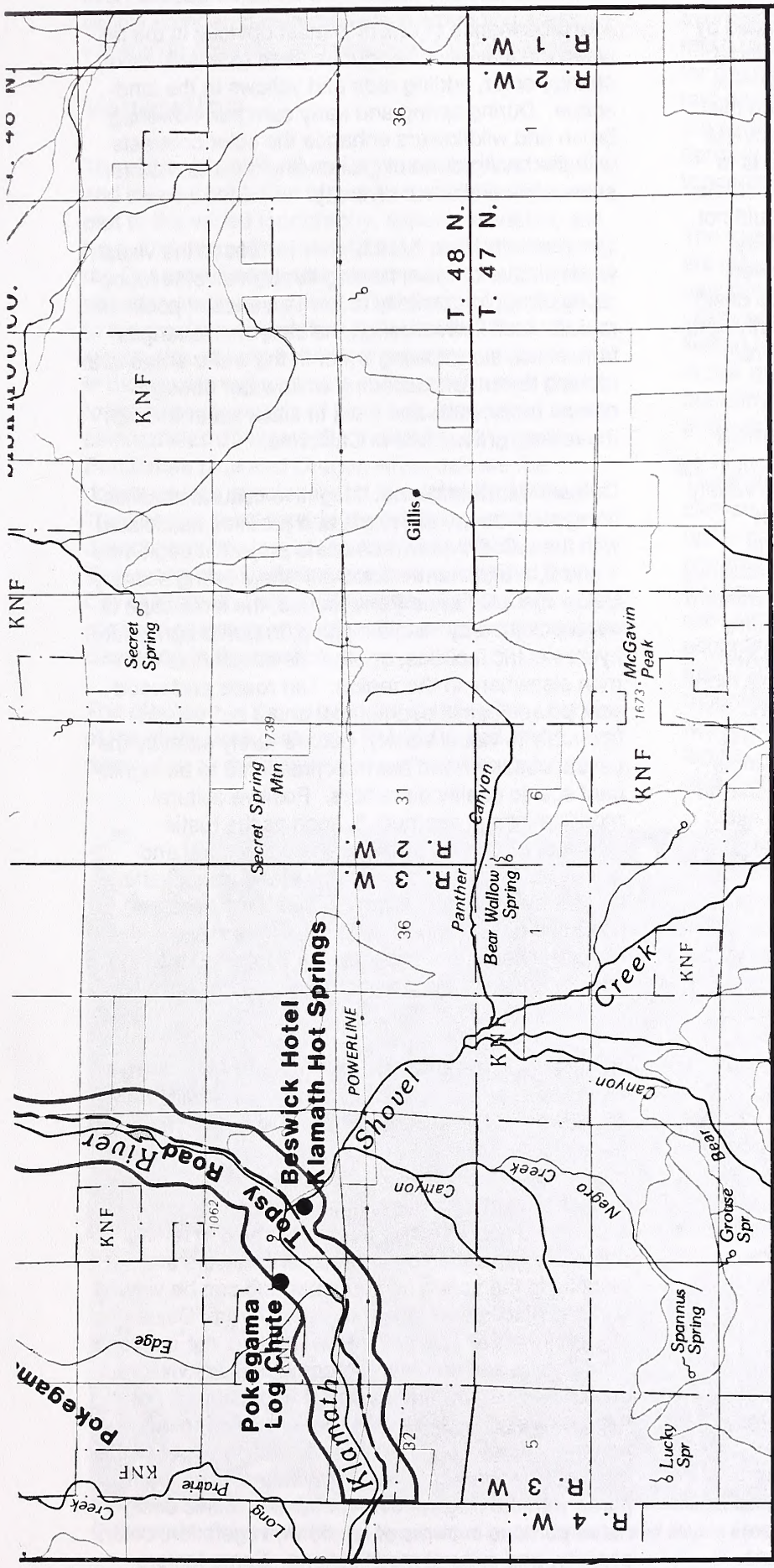
Two additional historic ranch sites found along Topsy Road are the Kerwin Ranch, where the foundations and apple orchard are still visible, and the Frain Ranch, purchased by Mart Frain in 1888 and deeded to his three sons in 1893. The Frain Ranch contains the visible remains of a log cabin, root cellar, barn, and garage. The orchard, pasture lands, and the log cabin are visible from the river. A pioneer cemetery, the Way Cemetery, is located off Topsy Road and contains the graves of Mart Frain and members of the Way, Ward, Overton, and Hoover families (all early ranching families). Topsy School, located at the foot of Topsy Grade, was attended by children of the nearby ranches and logging camps. All located within segment 2, these historic sites have had historical markers containing brief, descriptive accounts placed near them by the local historical society. Two other historic ranches within segment 2, the Hoover and Butler ranches, are on the west side of the river.

In addition to being a communication and travel corridor for towns east of the Cascade Range, the upper Klamath River played a major role in the logging operations of the area in the 1890's. A major engineering feature of these logging activities was a wooden log chute, known as the Pokegama log chute, that was cut into the western canyon wall in segment 3 (map 2-6) and put into operation in 1892. Logs were brought from the Pokegama plateau by train and unloaded at the top of the chute. After coming down the chute, logs floated down the river to the mill at the town of Klamathon. At the height of its operation, 300 logs per day were carried down the 2,000-foot chute and over 110 men were employed along the river to facilitate movement of the logs downstream. Today the only reminder of the log chute is a cut at the top of the canyon rim and a scar where the chute cut through the hillside, which are both visible from the river and Topsy Road. Two other logging operations, located in segment 2 below Topsy Grade and at the Kerwin Ranch, also used the river to float their logs to the mill.

Scenic

The visual quality of a landscape is based on landscape character. The stronger the influence of form, line, color, and texture, the more interesting the landscape; the more visual variety in a landscape, the more aesthetically pleasing it is. An assessment of landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications is used to classify the scenic quality of the area. A Visual Resource Management (VRM) Class rating is then made to manage the quality of the visual environment and to reduce the visual impact of development activities (BLM Handbook H-8410-1).





LEGEND

- Historic Sites
- Topsy Road
- Study Area Boundary

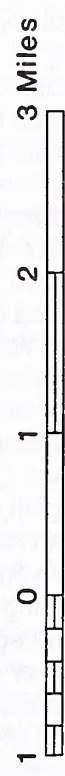


MAP 2-6

UPPER KLAMATH RIVER

HISTORIC SITES

March 1990



The upper Klamath River Canyon was evaluated by the BLM in 1977 and 1981. Segments 1, 2, and 3 received a Scenic Quality Class A evaluation—the highest scenic quality classification. Based on this classification, the area was then classified as VRM Class II. The Class II management objective is to retain the existing character of the landscape. Management activities in VRM Class II areas should not attract the attention of the casual observer. The upper Klamath River, from the J.C. Boyle Powerhouse to the Oregon-California state line, was designated the Klamath Scenic Waterway by majority vote in 1988, in part because of the valued scenic resources.

Landscape Characteristics. The upper Klamath River Canyon is the predominant visual element in the region, exhibiting considerably more landform variety than the surrounding plateau. The high desert canyon, classified by BLM (1978) as part of the Rolling Plateau within the Recent-age High Cascades physiographic province, cuts across the southeastern corner of the surrounding plateau. This extensive plateau is characterized by regular, rolling topography; whereas, the canyon exhibits considerably more landform variety with cliffs, steep slopes, upland benches, alluvial terraces, and a meandering river channel, which can all be encompassed in a single view. The portion of the canyon in Oregon is characterized by steep, layered basalt canyon walls, rising as high as 1,000 feet above the river, providing a strong sense of enclosure. Rock is exposed in approximately 35 percent of the canyon as vertical rock cliffs, bedrock outcrops, talus slopes, and rock slides. The canyon opens up in California, with rolling hills in the foreground and steep basalt cliffs and cinder cones in the background; this enhances the visual diversity, compared to the views upstream where the canyon is narrow and closer to the river.

From the river to the canyon rim, the visual quality of the study area is strongly influenced by the texture of the landscape. When viewed from a distance, the landscape appears as a mosaic of steep cliffs, talus slopes, conifer and deciduous stands, and rolling grassland areas. Viewed more closely, the rock outcrops combined with the vegetative diversity produces a strong visual impression.

Vegetation in the canyon is diverse due to elevation differences, aspect, slope, and soil diversity. Segments 1 and 2 are forested primarily by ponderosa pine, and in segment 3 by oak, but a wide variety of conifers, juniper, deciduous trees, shrubs, and grasses also occur throughout. Colors within the canyon, influenced heavily by the vegetation, are medium-to-dark greens, grays, browns, and tans.

The prominence of colors is most obvious in the fall when the leaves of deciduous trees (primarily oaks) change color, adding reds and yellows to the landscape. During spring and early summer, flowering brush and wildflowers enhance the color contrasts with the background of greens and browns. Winter snow adds additional diversity.

The Klamath River itself further increases the visual variety in the canyon, flowing through diverse topography, dropping steadily to form a series of pools and rapids. As it flows through the canyon, it changes from slack, slow flowing water in the wider areas to a rushing torrent of cascading whitewater through narrow rocky walls and back to slack water through the rolling, grassy hills in California.

Cultural Modifications. Negative cultural modifications, such as the dirt roads and facilities associated with the J.C. Boyle hydroelectric project in segments 1 and 2, are disharmonious with the existing scenery. Below the J.C. Boyle Powerhouse, the landscape is not dominated by visible logging, irrigated agriculture, hydroelectric facilities, or other developments common elsewhere in the region. Dirt roads and wood pole powerlines in segments 2 and 3 do not add favorably to visual variety, but are rarely seen by the casual observer and are not considered to be significant scenic quality detractors. Positive cultural modifications in segment 3, such as the rustic ranches, historic structures, and agricultural and grazing activities, add favorably to the visual variety and harmony in the canyon. The strong sense of cultural heritage and famous sites (described in the Historical section of this chapter) combined with the scenic beauty of the canyon draws visitors from outside the region.

Aesthetic Experiences. The Klamath River Canyon provides excellent opportunities to view wildlife and wildflowers, or to experience solitude. The chances of spotting a soaring eagle, grazing deer, swimming river otter, or an osprey diving for fish are high. The canyon's unique scenery enhances the recreation experience and thus has been described in rafting and other recreation brochures. Wildflowers are plentiful in the spring and summer and can be viewed in many places throughout the study area. Downstream from the J.C. Boyle Powerhouse, the canyon's remoteness and steep topography provides visitors uncrowded and natural aesthetic experiences, not usually available at the more popular and famous national parks, monuments, and rivers in or out of the region. The Klamath River Canyon's scenery compares with the Rogue River's wild and scenic designated portions in terms of landform, vegetation, color, scarcity, and cultural modifications. Some factors

even exceed those on the Rogue, such as landform variety compared to immediate surrounding areas, vegetation diversity, and seasonal color variations.

Vegetation

The upper Klamath River Canyon exhibits a unique and diverse collection of plant communities, due in part to the varied topography, aspect, elevation, soil type, and microclimates within the canyon. Bisecting the Cascade Range, the canyon cuts through distinct vegetative zones, adding to the diversity. In addition to the montane vegetation typical of the Cascade region, the canyon exhibits plant communities found in the interior valleys to the west and the high desert to the east. A mosaic of pine, oak, and mixed conifer communities dominate the make-up of the canyon. Ponderosa pine and Oregon white oak are the dominant tree species found throughout the canyon. The species discussed in the following community descriptions are representative, not all inclusive. These community descriptions were modified from City of Klamath Falls (1986) data. Appendix E contains common and scientific names for the species discussed in this section.

The elevation of the canyon rim in the upper 10 miles of the study area (between RM 224.5 and 214), referred to as the "upper canyon" for discussion of

vegetation, ranges from 4,400 feet to 3,400 feet, averaging 1,000 feet above the river. In the lower 11 miles (downstream from RM 214), or "lower canyon" for this discussion, the rim elevation goes from 3,900 feet down to 3,400 feet at the southern boundary of the study area. The upper canyon is more moist and densely forested than the lower canyon, where the topography and forest opens up and becomes drier.

The major plant communities found in the study area are mixed conifer forest, pine/juniper, pine/oak forest, oak forest, and oak/shrub. Meadows and riparian areas occur within the study area, but are small and limited to specific sites and conditions. Limited areas of oak grasslands occur on slopes and benches and are composed of grasses and oaks found in meadow and oak communities.

The mixed conifer forest is found on the rim, in the canyon bottom, and on north facing slopes of the upper canyon. Predominant overstory species in this community include ponderosa pine, Douglas-fir, and Oregon white oak. Incense-cedar, California black oak, sugar pine, golden chinquapin, and white fir occur less frequently in these stands. Predominate shrub species are snowberry, western serviceberry, mountain mahogany, deerbrush, and Oregon grape. More common forbs include wild strawberry and lupine; western fescue, pine bluegrass, blue wildrye, and medusahead wildrye are common grasses.



Oak grasslands are found in the river bottom and on benches and slopes above the river.

The pine/juniper community is found on drier, more exposed slopes in the upper canyon. The dominant overstory species are ponderosa pine and western juniper. Oregon white oak is sparse, but does occur. Understory shrub species include deerbrush, rabbitbrush, mountain mahogany, and occasionally gooseberry. Common forbs are buckwheat, common buttercup, pussytoes, Nuttall's gayophytum, and Puget balsamroot. Cheatgrass, hairy brome, medusahead wildrye, needlegrass, and pine bluegrass are some common grasses.

The pine/oak forest is found primarily in the lower canyon. Predominant overstory species are ponderosa pine and Oregon white oak, with incense cedar, Douglas-fir, and California black oak in the moister sites. Understory varies, with the drier sites made up of primarily wedgeleaf ceanothus and bitterbrush; deerbrush, poison oak, snowberry, western serviceberry, and rabbitbrush are found on moister sites.

The oak forest community occurs throughout the study area on dry slopes and in the river bottom. Oregon white oak, usually associated with ponderosa pine, western juniper, and California black oak, is the dominant tree. The understory varies according to aspect and stand density. Dominant shrubs include mountain mahogany, snowberry, wedgeleaf ceanothus, bitterbrush, rabbitbrush, deerbrush, and western serviceberry; Puget balsamroot, Idaho fescue, bluebunch wheatgrass, cheatgrass, bottlebrush squirreltail, junegrass, needlegrass, and medusahead wildrye are common forbs and grasses.

The oak/shrub community is found throughout the study area on slopes and benchlands. Oregon white oak is dominant and can occur as a small, shrubby tree. Associated trees are ponderosa pine, western juniper, Douglas-fir, and sugar pine. Understory vegetation varies with site location, but common shrubs include mountain mahogany, wedgeleaf ceanothus, manzanita, poison oak, deerbrush, snowberry, and rabbitbrush. Forbs and grasses are well developed in open areas and include Puget balsamroot, mountain dandelion, yarrow, Solomon-plume, large-flowered collomia, woolly sunflower, buckwheat, and tarweed; common grasses are cheatgrass, bluebunch wheatgrass, needlegrass, hairy brome, two-flowered fescue, pine bluegrass, and bottlebrush squirreltail.

Small meadows occur in the river bottom of the upper canyon as a result of early homesteaders clearing the land for agriculture, on moist benches above the river in the lower canyon, and on both sides of the river in segment 3. In addition to the forbs and grasses mentioned in the previous plant communities, typical

forbs include California poppy, least hopclover, and tidy-tips; soft cheat, bulbous bluegrass, foxtail barley, and few-flowered wild oatgrass are typical grasses.

The few riparian communities occur in narrow bands along the river, in drainages along the canyon, and on the edges of islands in the river. Due to the fluctuating river levels from the outflow of the J.C. Boyle Powerhouse, the establishment of streamside riparian vegetation is limited. Predominant riparian overstory species are Oregon white oak, birch, white alder, and Oregon ash. Blue elderberry, Lewis mockorange, willow, Douglas spiraea, and western wild grape make up the common shrub layer. Common forbs include watercress, monkey-flower, speedwell, cattail, and boreal bog-orchid; reed canary grass, sedges, and rushes are also present. Although not a major component of the riparian community, stands of quaking aspen are found in drainages along the canyon.

The occurrence of threatened and endangered plants in the study area are unknown at the present time. Limited surveys have been conducted in the past to document these species. Several species occur nearby and may potentially be found in the study area. One Federal candidate species (Category 2), the pygmy monkey-flower, has been found on the Ward Road, which is adjacent to the west rim in the upper canyon, just outside the study area boundary (Tomlins 1989, pers. comm.). Another candidate species, Green's mariposa lily, has been found south of the study area. A portion of the canyon is within the historic range of this species and it potentially occurs here (Brock 1988), although none were found in 1986 during the City of Klamath Falls' survey. Short-podded thelypody is a forb that historically has been found on the Klamath River near the town of Keno (Abrams 1944) and may occur in the study area (King 1989, pers. comm.). This Category 3C species has been nominated for the BLM's sensitive species list by the Lakeview District BLM. In addition, the Oregon Natural Heritage Database has listed this species as threatened in Oregon, but more common or stable elsewhere.

Water

Water resources are a key component in shaping the animal and plant communities found within the study area. Although the river within the study area is the primary focus of examination, factors upstream significantly affect this portion of the river. Those factors that are discussed in this section include water rights, flows, beneficial uses, quality (including that of Upper Klamath Lake), and temperature.

Water Rights. Within the Oregon portion of the study area (segments 1 and 2), PP&L is licensed to divert up to 2,500 cubic feet per second (cfs) of Klamath River water for the operation of the J.C. Boyle hydroelectric project. In addition, PP&L has three other water right claims which were acquired with the purchase of land adjacent to the river. Two of the permits allow diversion from the Klamath River and one uses water from small tributaries of the Klamath; all three are for irrigation, stock, and domestic use. The volume of water that could be withdrawn by these three permits is an insignificant portion of the total river volume. The Oregon State Department of Forestry has a permit to use up to 10,000 gallons of water per day from an unnamed tributary of the Klamath River (segment 2), near the Topsy Road, for dust abatement. The City of Klamath Falls currently has an application pending with the Federal Energy Regulatory Commission for licensing of a hydroelectric project which would be located primarily within segment 2. The City recently submitted an application to the State of Oregon Water Resources Department for the diversion of water for hydroelectric generation, but the Water Resources Department rejected the application for the project. This is currently being appealed by the applicant.

The Bureau of Reclamation's Klamath Project diverts water from the Klamath River near the city of Klamath Falls for agricultural irrigation. Rights were claimed for all unappropriated waters of the Klamath River Basin by the Bureau of Reclamation for this project. The Oregon Water Resources Department is in the process of adjudicating all water claims in the Klamath River Basin. The Oregon Department of Parks and Recreation and the ODFW have applied to the Water Resources Department for an instream water right on the Klamath Scenic Waterway (segment 2). Based on the release regime from the J.C. Boyle Powerhouse, the application requests 1,500 cfs for recreation and 550 cfs (not additive) for fish population and habitat. Within the California portion of the study area (segment 3), the California State Water Resources Control Board currently does not have any water use applications or claim of rights on file, although water is being diverted from the main stem and from Shovel Creek to irrigate pastureland.

The Klamath River Basin Compact, discussed in chapter 1, provides guidance along with other applicable laws for water rights administration in the Klamath Basin.

The major purposes of the Klamath River Basin Compact, as stated in Article I, are:

A. To facilitate and promote the orderly, integrated

and comprehensive development, use, conservation and control thereof for various purposes, including, among others: the use of water for domestic purposes; the development of lands by irrigation and other means; the protection and enhancement of fish, wildlife, and recreational resources; the use of water for industrial purposes and hydroelectric power production; and the use and control of water for navigation and flood prevention.

B. To further intergovernmental cooperation and comity with respect to these resources and programs for their use and development and to remove causes of present and future controversies by providing (1) for equitable distribution and use of water among the two states and the Federal Government, (2) for preferential rights to the use of water after the effective date of this compact for the anticipated ultimate requirements for domestic and irrigation purposes in the upper Klamath River Basin in Oregon and California, and (3) for prescribed relationships between beneficial uses of water as a practicable means of accomplishing such distribution and use.

Stream Flows. Flows in segment 1 between the dam and the powerhouse are not subject to the daily fluctuations occurring in segments 2 and 3 that are caused by power generation at the powerhouse. A minimum flow of 100 cfs is released at the J.C. Boyle Dam into the stream channel to provide adequate instream flow for fish movement through segment 1. In addition to this continuous outflow at the dam, a series of springs in the riverbed between the dam and the powerhouse add another estimated 250 to 300 cfs of flow, which keeps a relatively constant flow of approximately 350 to 400 cfs during summer.

Stream flows have been measured since January 1959 by the United States Geological Survey (USGS) at a gaging station, located 0.7 mile below the J.C. Boyle Powerhouse. Data from water year (October to September) 1961 through 1988 show an average annual flow of 1,926 cfs with a maximum discharge of 11,000 cfs measured in March 1972 and a minimum flow of 283 cfs in February 1968. Mean monthly flow data, displayed in table 2-7, show that highest monthly flows occur December through April and lowest occur June through August.

The J.C. Boyle Powerhouse typically operates in a peaking mode with one turbine during low flow periods (summer) anywhere between 4 a.m. and 4 p.m., and both turbines, at times continuously, during high flow (late winter/early spring). Peaking operations cause significant daily water fluctuations in the

Table 2-7. Mean Discharges and Percent Annual Runoff, Klamath River

Month	Mean (cfs)	Minimum (cfs)	Maximum (cfs)	Percent Annual Runoff
OCT	1,688	786	3,157	7.3
NOV	2,198	897	3,989	9.5
DEC	2,703	1,112	5,733	11.7
JAN	2,671	1,174	7,905	11.6
FEB	2,726	1,091	7,780	11.7
MAR	3,155	634	8,755	13.7
APR	2,552	723	5,645	11.0
MAY	1,726	591	3,935	7.5
JUN	873	550	2,328	3.8
JUL	651	501	1,339	2.8
AUG	904	591	1,054	3.9
SEP	1,260	776	1,876	5.5
ANNUAL	1,926	786	4,458	100

Note: All data were measured at USGS gaging station below J.C. Boyle Powerhouse (RM 219.9) between 1961 and 1988.

river. In the summer this ranges from a baseflow of 300 to 400 cfs (outflow from the dam and springs in segment 1) to approximately 1,500 cfs with one turbine running (1,250 cfs maximum throughflow at each turbine). During highflow periods (winter), with both turbines running and water spilling over the dam, river flows range from 3,000 to 8,000 cfs. The daily winter fluctuations are less drastic since baseflow is much higher due to precipitation or seasonal runoff. Actual effects of typical summer peaking operations (one turbine) on the river level are seen in a vertical difference of approximately 1 to 2 feet between high and low flow. During periods of nongeneration, this dewatering leaves a portion of the streambed exposed and dry.

Beneficial Uses. The appropriation of the surface waters of the Klamath basin is governed by State law and the Klamath River Basin Compact (ORS 542.620). The Compact became effective in 1957 upon ratification by Oregon, California, and the U.S. Congress. Article III of the Compact addresses beneficial uses in the Klamath River Basin.

The Oregon Department of Environmental Quality (DEQ) has expanded upon these beneficial uses specifically for water quality management purposes of the Klamath River (OAR 350-41-962). These established beneficial uses are public and private domestic

water supply, industrial water supply, irrigation, livestock watering, salmonid fish rearing and spawning, resident fish and aquatic life, wildlife and hunting, fishing and boating, water contact recreation, and aesthetic quality.

In addition, the California State Water Resources Control Board (1988) has established beneficial uses for water in the North Coast Region; these are broadly categorized as water supply, recreation, fish and wildlife habitat, navigation, power generation, and scientific study. They have also outlined specific existing and potential beneficial uses for Klamath River water in California. These existing beneficial uses include municipal and domestic supply, agricultural supply, industrial process supply, industrial service supply, groundwater recharge, freshwater replenishment, navigation, contact and non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, fish migration, and fish spawning.

Water Quality. Water quality standards have been set by the Oregon DEQ for Klamath Basin waters and specifically for the Klamath River from Upper Klamath Lake to the state line (OAR 340-41-965). In California, the State Water Resources Control Board (1988) has established water quality objectives for the upper Klamath River. Water quality is monitored monthly by

the Oregon DEQ at several locations above the Keno Dam and at the USGS gaging station just below the J.C. Boyle Powerhouse (RM 219.9). The City of Klamath Falls (1986) has also monitored water quality at several locations between Keno Dam and Copco Reservoir in relation to the proposed Salt Caves project. Some of these data, displayed in table 2-8, show that Oregon DEQ water quality standards (range values) were violated for dissolved oxygen, pH, conductivity, and total coliform.

Water quality of the Klamath River within the study area is affected by upstream point and nonpoint sources of pollutants which enter the main stem of the river. The Klamath River upstream from Keno Dam has been listed by Oregon DEQ (1988) as a water-body suspected of being "water quality limited" due to detection of toxic pollutants above criteria set by the Environmental Protection Agency (EPA). The pollutants include mercury found in fish tissue, and lead, arsenic, and zinc measured in bottom sediments. The ambient data indicate that the presence of mercury is derived from industrial sources, but

Table 2-8. Mean and Range Values* for Observed Water Quality Parameters, Mainstem Klamath River

Parameter	Water Quality Standards				
	Keno Bridge ¹ RM 234.9	USGS Gaging Station RM 219.9	Segment 3 ⁷ RM 205.5	Oregon- Klamath Basin	California- Klamath River (Above Irongate Dam)
Temperature (°C)	12.4 (0.5-23.9)	12.5 (0-24.0) ²	12.5 (1.7-19.7)		
Dissolved Oxygen (mg/l) (% saturation)	7.7 (3.0-12.6) 81 (6-145)	9.4 (3.4-12.8) ² 98 (40-138) ²	9.2 (7.5-11.2)	not >7.0 (Keno Dam to state line)	7.0-10.0
pH (units)	7.8 (6.5-9.3)	7.9 (7.3-9.1) ²	7.7 (7.1-8.7)	7.0-9.0	7.0-8.5
Conductivity (umhos at 25°C)	181 (140-253)	289 (120-2,740) ³	151 (117-258)	not >400 umhos at 25°C measured at border	275 umhos
Turbidity (FTU) (JTU)	9.2 (1.0-38.0)	4.9 (1.0-21.0) ⁴ 10.5 (1.0-74.0) ⁵	9.4 (2.1-30)		
Total Suspended Solids (mg/l)		16.9 (1.0-105.0)		10.9 (1.6-26.9)	
Total Coliform (MPN/100 ml)	(30-45,000)	665 (23-7,000) ⁶	371 (23-1,600)	average not >1,000/100 ml	
Nitrates (ugN/l)	150 (20-550)	438 (20-2,300) ⁴	445 (100-940)	10,000	
Total Ammonia (ugN/l)	600 (70-1,440)	416 (10-580)	123 (10-580)		
Un-ionized Ammonia (ugN/l)	8.5 (0.3-50) ²				
Orthophosphate (ugP/l)	136 (17-270)	332 (0-2,800) ⁵	117 (60-220)		
Total Phosphorus (ugP/l)	279 (94-724)	230 (91-500) ⁴	202 (120-350)		
BOD (mg/l)		2.7 (0.3-6.3) ²			

*Range values are in parentheses.

1 = 1977-1983 Oregon DEQ
2 = 1959-1988 Oregon DEQ
3 = 1960-1987 Oregon DEQ
4 = 1977-1988 Oregon DEQ
5 = 1959-1976 Oregon DEQ
6 = 1972-1988 Oregon DEQ
7 = 1984-1985 Station KR-5,
City of Klamath Falls

ABBREVIATIONS USED IN THIS TABLE
mg/l = milligrams per liter
umhos = micromhos
FTU = Formazin Turbidity Units
JTU = Jackson Turbidity Units
MPN = most probable number technique
ugN/l = micrograms nitrogen per liter
ugP/l = micrograms phosphorus per liter
BOD = biochemical oxygen demand

insufficient information is available on the heavy metals associated with the bottom sediments to assess their effects on water quality or to determine their source of origin.

Some potential sources of these pollutants include wastewater effluent from city and suburban sewage treatment facilities and lumber mills adjacent to the river, irrigation returns at Klamath Straits drain, and naturally-occurring background levels of heavy metals in river sediments. The State has primary responsibility to prevent, reduce, or eliminate pollution and is currently developing water quality assessment plans and control strategies for those waterbodies that are either not meeting or suspected of not meeting water quality standards and thus not supporting beneficial uses. As part of these studies, Oregon DEQ (1988) is establishing total maximum daily loads (TMDLs) for municipalities and industries discharging effluent into the Klamath River. Oregon DEQ water quality data also show that the Klamath River above Keno Dam violates dissolved oxygen and pH standards and exceeds EPA established toxic criteria levels of un-ionized ammonia during low summer flows. To address this problem, DEQ has proposed TMDLs for ammonia and biochemical oxygen demand (BOD); both measure pollutants that lower the oxygen content in the river.

The Klamath Project, administered by the U.S. Bureau of Reclamation, started in 1905 to provide irrigation water and flood control to reclaimed lands of Lower Klamath and Tule lakes. The project area includes 233,625 acres of irrigable lands in the Klamath Basin. The project, which has the largest water rights appropriation in the basin, diverts water from Upper Klamath Lake and Klamath River through canals and ditches to various irrigation districts and the Tule Lake National Wildlife Refuge Complex. Drainage water from this closed basin is conveyed back into the Klamath River via the Klamath Straits Drain, entering the river upstream from Keno, Oregon.

The source of the Klamath River—Upper Klamath Lake—is another potential source of nonpoint pollution. Upper Klamath Lake is a hyper-eutrophic lake that supports an abundant algal population. Lake water quality varies according to season and the annual amount of runoff entering the lake. Recent studies (Coleman, et al. 1988) have pointed out that the eutrophic condition of the lake, though natural, has been accelerated through agricultural activities, livestock production, logging, urban development, and reclamation of wetlands for agriculture, which have created a significant increase in organic nutrients entering the lake. This high, external nutrient loading, combined with internal nutrient rich sediments, high

concentrations of nutrients in groundwater, and extremely shallow waters (mean lake depth of eight feet) cause massive blooms of blue-green algae that typically occur in the lake in the summer. These blooms result in poor water quality conditions, which include extremely high pH and wide fluctuations in levels of dissolved oxygen and carbonic acid. As the pH increases, the toxicity of un-ionized ammonia also increases. Table 2-9 shows water quality data collected during this critical period. These conditions, along with regional agricultural runoff and other nonpoint source pollution entering the Klamath River between the outlet of the lake and Keno Dam, contribute to river water quality problems that can occur in the study area during low summer flows. As these massive quantities of blue-green algae decay and flow downstream, they increase the BOD and lower dissolved oxygen levels. This can be offset by aeration occurring naturally in the river. In addition, the algae can impart a bad odor to water and a detrimental taste to game fish. This high nutrient loading, although detrimental to the Upper Klamath Lake, helps maintain the productive wild rainbow trout population downstream—the nutrient-rich waters provide a food source for the flourishing aquatic invertebrates, which in turn provide an abundant prey base for rainbow trout.

Water quality downstream from pollution sources will naturally improve due to dilution of the pollutants. This mixing occurs on the Klamath River as low quality waters flow downstream. In addition, the heavy algal loads are diluted and mixed in the water column and dissolved oxygen levels increase as water flows through turbulent sections downstream and is aerated. Dissolved organic matter within the water contributes to the distinctive coffee color and foam that is often noted on the Klamath River. In-stream reservoirs such as J.C. Boyle and Keno can improve or degrade water quality. According to one source (City of Klamath Falls 1986), the presence of instream reservoirs can reduce pH, bacterial counts, nutrients, sediments and turbidity, BOD, and settling of algal loads. Conversely, another study on the Klamath River (Phinney and Peck 1960) stated that impoundments greatly increase organic loads and burden the river.

Water Temperature. River water temperatures in the study area vary with season and by segment. Highest water temperatures occur June through August in conjunction with increasing local air temperatures, lower flows, and degraded water quality. Daily summer temperature fluctuations are least in segment 1 and greatest in segments 2 and 3. Because of the stable flows and instream springs in segment 1, temperatures remain relatively constant, typically

Table 2-9. Klamath River Water Quality Parameters (Median Values) During Critical Period, June-October, 1977-1987

Parameter		Klamath Strait (RM 240.3)	Keno Bridge (RM 234.9)	USGS Gaging Station (RM 219.9)
Dissolved Oxygen	(mg/l)	4.2	5.4	8.8
	(% sat)	52	60	100
Total Ammonia	(ug/l)	380	450	180
Un-ionized Ammonia	(ug/l)	51	32	6
Nitrate	(ug/l)	80	40	570
Phosphate	(ug/l)	500	305	254
Orthophosphates	(ug/l)	290	145	156
pH		8.5	8.3	8.2
BOD	(mg/l)	5.0	4.6	2.7

Source: Oregon DEQ 1988.

around 70° F (Fahrenheit) in August and 48 to 53 degrees F in early spring. Mid-day peaking operations at the J.C. Boyle Powerhouse cause significant daily temperature fluctuations in segments 2 and 3—in August typically reaching a high of 70° F in early evening following the passage of the warmer large volume of reservoir water from turbine operations, and a low of 58° F in early morning hours (City of Klamath Falls 1986). Between 1959 and 1988 the maximum water temperature recorded at the USGS station in segment 2 was 75.2° F and the minimum was 32° F.

Geology

Regional Geology. The upper Klamath River is in a transition area between the High Cascade and Basin and Range provinces. High Cascade features include Quaternary-age volcanic flows, mostly basaltic and andesitic, that cap older volcanic deposits; cinder cones from minor upper Pleistocene and Recent-age pyroclastic eruptive centers. The volcanic rocks near Copco Lake are intruded by numerous dikes and plugs of andesite, rhyolite, and basalt. Significant volcanic centers along the Cascade Range include Mt. McLoughlin, 30 miles north of the area, and Mt. Shasta, 40 miles south. Local Basin and Range features include a series of fault block mountains separated by basins; and normal faults that run in a north-northwest direction with the down-thrown side to the northeast, creating an en echelon or stair-step pattern. Evidence of these fault patterns is found north and east of the study area. The study area has

low seismotectonic (earthquake) activity; however, there is ongoing tectonic activity to the west.

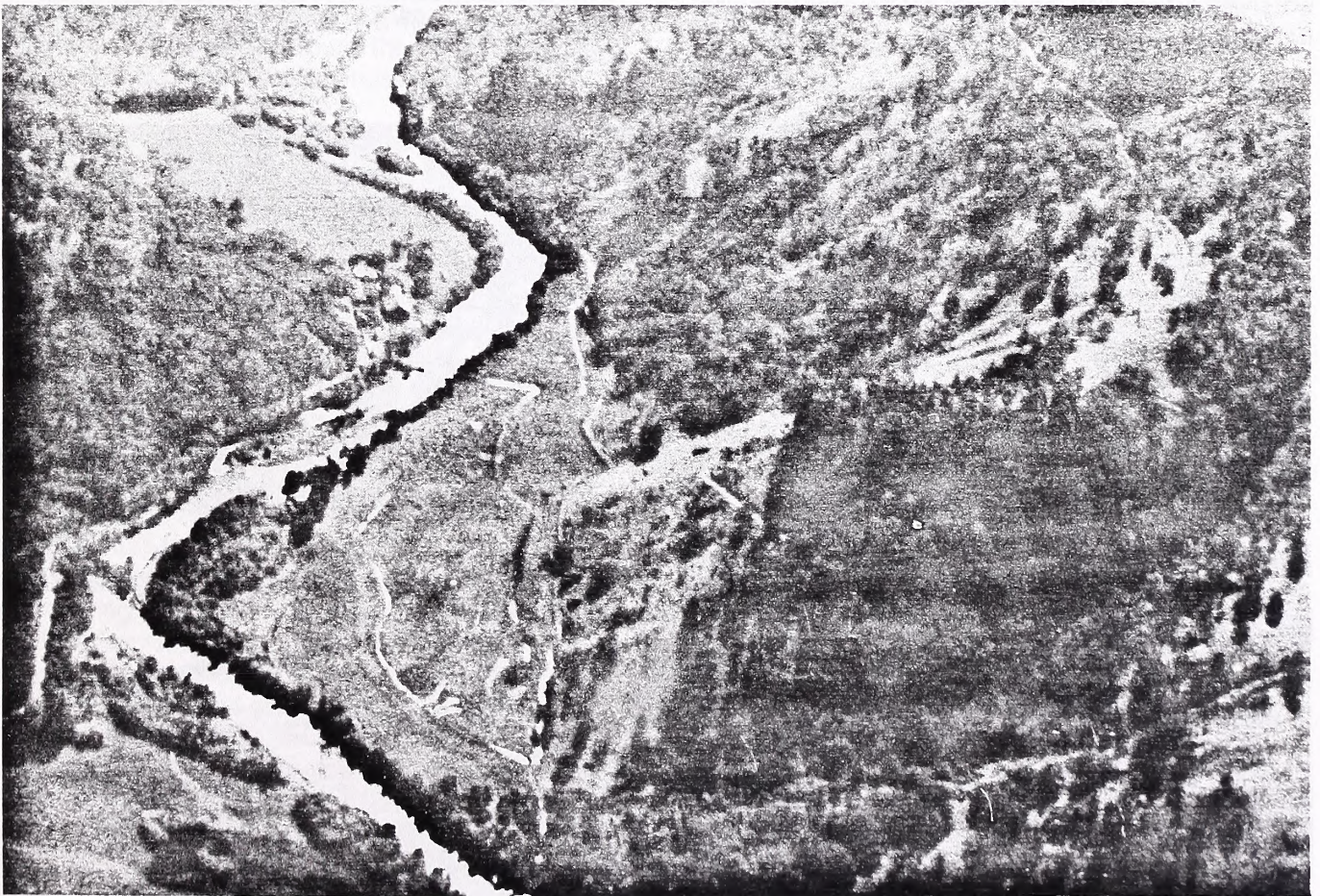
Lithology. The oldest exposed rock in the study area is a rapidly weathering middle to upper Miocene-age tuff of unknown thickness with varying degrees of welding. The Salt Caves anticline structure occurs in this welded tuff. Folding is rarely noted in welded tuff. The cause of the Salt Caves folded structure is unknown, but is considered unlikely to have a tectonic origin (that is resulting from structural deformation of the earth's crust). The Miocene tuff is overlain by upper Tertiary- to Pleistocene-age basalts and andesites that are approximately 900 to 1,000 feet thick; the basalts and andesites are overlain by Quaternary alluvium, colluvium, talus, lacustrine, and landslide deposits. Landslides are most common in the southern half of segment 2.

Mineral Resources. No economic mineral deposits are known to exist in the study area. Potential mineral resources are too remote or of insufficient quality or quantity to be extracted economically. These potential resources include gravel deposits, diatomite (clay) beds, basalt and andesitic basalt quarry sites (used for roads and as rip rap), and geothermal resources in segment 3. No Federal oil, gas, or geothermal leases exist in the study area.

Soils. The soils in the study area are relatively shallow and rocky with a generally high clay content in either the surface or subsurface layers. Soil

textures are somewhat variable and include gravelly loam, stony loam, cobbly loam, gravelly clay loam, clay loams, and clays. Erosion and mass soil movements are characteristic occurrences in the geomorphically young Klamath River Canyon, which is being actively downcut by the upper Klamath River. There are some major landslides in the canyon, such as the one on the east side of the canyon at RM 214 and the one on the northwest side of the canyon between RM 210 and 211.

Chapter 3 – Eligibility Determination



In the extreme lower right of the photo the Pokegama log chute resembles a road cut.

Introduction

The Wild and Scenic Rivers Act states that to be considered for inclusion in the National Wild and Scenic Rivers System (NWSRS), a river or river segment must be free-flowing and, with its immediate environment, must possess one or more outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.

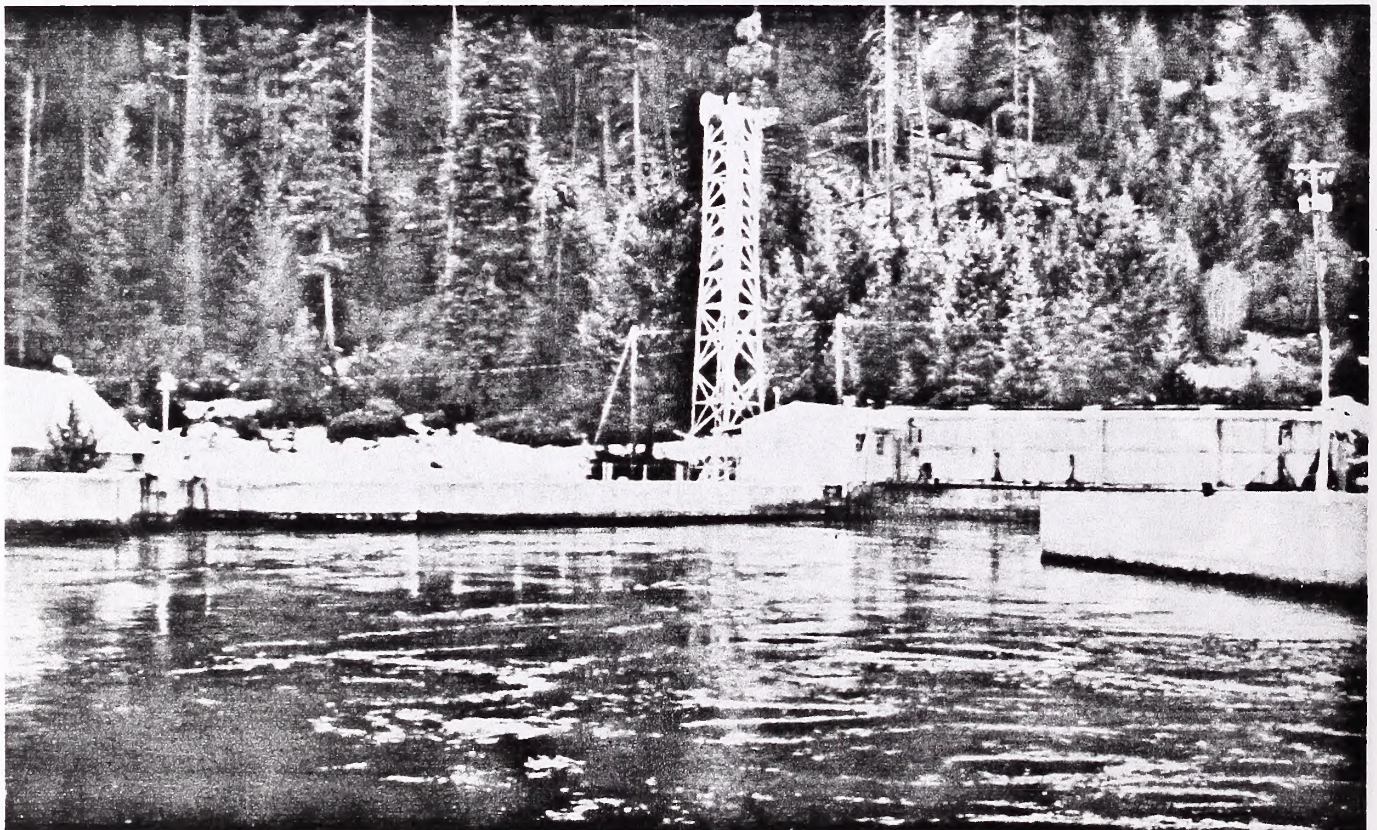
This chapter discusses the definition of free-flowing and whether or not segments fit that definition; BLM criteria for assessing outstandingly remarkable values; and the outstandingly remarkable values in each segment. The descriptions of outstandingly remarkable values are summaries only, based on the comprehensive description of each resource in chapter 2.

Free-Flowing

Free-flowing, as defined in Section 16(b) of the Wild and Scenic Rivers Act, means "existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway." Free-flowing should not be confused with naturally flowing, which is flowing without any up-

stream manipulation except by nature. The presence of impoundments above and below the segment (including those that regulate the flow regime through the segment) and existing minor dams and diversion structures within the study reach will not by themselves render a river ineligible. There are many river segments in the NWSRS that are downstream from major dams, such as the Rogue River in Oregon and the lower Klamath River in California, or are between dams, such as the Tuolumne River in California. Some components of the system, such as the Clackamas, Deschutes, and Snake rivers in Oregon and the Trinity River in California, even derive their recreational values, at least in part, from the operation of upstream dams.

At the northernmost portion of segment 1, up to 2,500 cubic feet per second (cfs) of the upper Klamath River's natural flow is continuously diverted at the J.C. Boyle Dam. It passes through an above-ground concrete flume for 2.1 miles, enters a 0.3 mile long tunnel that passes through the canyon wall, and plunges down penstocks and through turbines at the J.C. Boyle Powerhouse, before being returned to the natural riverbed at approximately RM 220.6. The summertime flow between the dam and powerhouse remains a fairly constant 350 to 400 cfs (100 cfs is released at the dam and 250 to 300 cfs is from natural springs).



Concrete forebay at end of flume in segment 1.

Construction of the above-ground flume and access road for the J.C. Boyle project resulted in substantial modification of portions of the west bank of the river in segment 1. Portions of the west side are now fill-slope and large boulders were used to stabilize the toe of the slope. The construction of the spillway in segment 1 also resulted in modifications of the waterway. Large basalt boulders were placed along the west bank of the river to prevent erosion if water is released from this spillway. Bank modification occurs along the upper 2.1 miles of segment 1 between the J.C. Boyle Dam and the entrance of the tunnel in the canyon wall (approximately RM 224.5 to 222.6).

Segment 1. Because of the major modification of the waterway and the significant continuous diversion of water, it was determined that segment 1 does not meet the definition of "free-flowing" in the Wild and Scenic Rivers Act. Because segment 1 is not free-flowing, it does not meet the eligibility requirements in section 2(b) of the Act for inclusion in the NWSRS.

Segments 2 and 3. Water flows in segments 2 and 3 fluctuate daily and seasonally, depending on whether one, two, or neither of the J.C. Boyle turbines are in operation. In the summer, with both turbines shut down, flows average 350 to 400 cfs. With one turbine operating, flows are 1,500 cfs. In the winter, both turbines usually operate around the clock, releasing up to 2,500 cfs, depending on upstream flows.

Segments 2 and 3 were determined to meet the definition of "free-flowing." Although the flows fluctuate, the original volume of water that was diverted at the J.C. Boyle Dam is returned to the river bed at the powerhouse, keeping the volume consistent with that of the upper Klamath River above the J.C. Boyle Dam. There are no significant alterations of the stream bank in segments 2 and 3.

Applicability of Free-Flowing Definition. The definition of "free-flowing", as found in the Wild and Scenic Rivers Act, is not always easily applied to all river segments. In the case of the Upper Klamath River, the BLM's river study team and managers readily determined segments 2 and 3 to clearly meet free-flowing criteria. The determination for segment 1, on the other hand, was not so readily apparent and required extensive consideration and reconsideration of river attributes and consultation with experts familiar with application of the Wild and Scenic Rivers Act. The Oregon State Parks and Recreation Department disagrees with BLM's application of free-flowing criterion for segment 1 and feels that the lower 2.8 miles of segment 1 (from the concrete flume tunnel opening near RM 222.6 to the stream gauge below the J.C. Boyle Powerhouse at RM 219.7) appears to

meet the Wild and Scenic Rivers Act definition of free-flowing. The BLM acknowledges the State's opinion, but has not changed its finding in this particular situation that segment 1 is not free-flowing.

Outstandingly Remarkable Values

The second criteria that a river must meet to be eligible for inclusion in the NWSRS is that it must possess one or more outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The term "outstandingly remarkable" is not precisely defined in the Wild and Scenic Rivers Act; consequently, the determination of whether or not a river area contains outstandingly remarkable values is based on the professional judgement of the interdisciplinary study team and responsible BLM line managers.

The BLM has developed a set of criteria to assess outstandingly remarkable values (Instruction Memorandum OR-89-632). These values, which must be directly river-related, are considered outstandingly remarkable if they are unique or exemplary compared to similar values in other river areas in the region. The outstandingly remarkable features should also be at least regionally significant. Unless otherwise specified, the region used in this report is Region 9, one of the geographic regions described in chapter 1 of the 1988 Statewide Comprehensive Outdoor Recreation Plan (SCORP). The SCORP was developed by the Parks Department with input and consul-



Above-ground flume and shoreline modification in segment 1.

tation of all Federal, State, and local recreation suppliers and concerns following the guidelines of the Land and Water Conservation Fund Act of 1965 (Public Law 188-578). This plan is a result of a regional effort to identify recreation needs in Oregon, Washington, and Idaho, and was developed by Federal, State, and local recreation agencies along with private, nonprofit, and commercial organizations which provide outdoor recreation resources, facilities, and services to the public. The upper Klamath River is in Southwestern Region 9, which includes Jackson, Josephine, Klamath, and most of Douglas counties in Oregon (see appendix F). Siskiyou County, California is included in the region to include a comparison of values in segment 3.

The upper Klamath River has been the subject of a number of resource studies. Based on values identified in those studies, comparison of similar resource values in the region, public comment analysis, coordination with other agencies, and on-the-ground surveys, it has been determined that the outstandingly remarkable values in segments 2 and/or 3 are recreational, wildlife, fish, prehistoric, historic, scenic, and Native American traditional use. In addition to the presence of each individual outstandingly remarkable value, the fact that all the values coexist and can be enjoyed in combination with one another enhances the experience in the Klamath River Canyon. These values are summarized by segment in table 3-1.

Although it was determined that segment 1 does not meet the "free-flowing" definition, its resource values are briefly mentioned here for report completeness and information purposes. Segment 1 has outstandingly remarkable fish resources because of the presence of wild rainbow trout and the importance of the area as rearing habitat. Two Federal and State endangered (Lost River and Shortnose suckers) and a Federal candidate and State sensitive (Klamath largescale sucker) species are potentially present in this segment. Fishing in segment 1 is considered to be outstandingly remarkable. Considerable effort has been exerted by the ODFW to protect and enhance this fishery. The river's reputation draws anglers from outside the region. There is one prairie falcon nest in the portion of segment 1 that BLM designated as falcon habitat (map 2-5). Bald eagles and falcons occasionally forage in this area. Wildlife use in segment 1 is not as significant as that in segments 2 and 3. No known prehistoric sites exist above the powerhouse. Historic Topsy Road only briefly enters the study area. Although segment 1 is designated Scenic Class A, there are too many negative cultural modifications to consider the scenic value outstandingly remarkable. Geologic values are significant, but not outstanding.

Recreation Resources

Eligibility Criteria. Recreational opportunities are or have the potential to be unique enough to attract visitors from outside the geographic region. Visitors would be willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but not be limited to, sightseeing, wildlife observation, photography, hiking, fishing, trapping, hunting, and boating. Interpretive opportunities may be exceptional and attract or have the potential to attract visitors from outside the geographic region. The river may provide or have the potential to provide settings for national or regional commercial usage or competitive events (BLM Instruction Memorandum OR-89-632).

Segment 2. The outstandingly remarkable recreational values in segment 2 are whitewater boating and fishing. Whitewater boating is outstandingly remarkable because of the quality and variety of year-round boating opportunities provided. The upper Klamath River provides the only year-round Class IV-V run in the region (the lower Klamath and Rogue rivers offer year-round Class III-IV rapids). This attracts visitors from outside the region who are willing to travel long distances to experience the technically challenging whitewater run and associated recreational experiences. There are more rapids (52) in this section of the river, ranging from Class I to Class V, than in most other rivers in the western United States. Rafting opportunities in segment 2 can be divided by class of rapid. The first half, from RM 220.1 to 214.3, offers less technical Class I-III opportunities. The lower half, from RM 214.3 to 209.3, offers highly technical whitewater boating with 10 Class I-II rapids and 18 Class III-V rapids. This relatively short distance (five river miles), combined with the quantity and classification of rapids, provides an experience not found on other rivers in Oregon and northern California. The upper Klamath River is also the only river in the region to offer one-day trips with year-round Class III-V rapids, attracting both private and commercial boaters. Most of the private boaters (rafters, canoeists, and kayakers) are from within the region, whereas most of the commercial rafting outfitters and their clients are from outside the region, primarily from the San Francisco Bay area and northern California.

Fishing is considered to be of outstandingly remarkable value. The river provides an excellent trout fishery and is reputed to be one of the better fly fishing rivers in Oregon. The upper Klamath River provides a fishery for wild rainbow trout with an excellent rate of catch that is rivaled in Oregon only by the Deschutes River. Relatively calm water flows

Table 3-1. Summary of Outstandingly Remarkable Resources in the Upper Klamath River Study Area

Segment	Resource	Outstandingly Remarkable Characteristics
2	Recreation	Offers a variety of year-round whitewater boating opportunities for rafters, canoeists, and kayakers; provides only year-round Class III-V run in Oregon and northern California, attracting visitors from outside the region who are willing to travel long distances to experience the quality whitewater run; contains more rapids (52) in this segment, ranging from Class I-V, than in most other rivers in the western United States; offers excellent fishery for wild rainbow trout with a size and catch rate among the highest in the state; nearly unlimited shoreline access; year-round fishing season; attracts anglers from outside the region.
	Wildlife	High degree of diversity of wildlife and T&E species; high habitat diversity; five known prairie falcon nest sites; historic peregrine falcon nest eyrie; high potential for reintroducing peregrine falcons; bald eagle nesting territory; primary area of use by the listed T&E species; maternity colony of Townsend's big-eared bat.
	Fish	Inhabited by highly productive, genetically unique wild rainbow trout population; one of six designated wild rainbow trout rivers in the state; potentially inhabited by Lost River and Shortnose suckers (Federal and State endangered) and by Klamath largescale sucker (Federal candidate and State sensitive).
	Prehistoric	High density of sites (40), including village sites, hunting, fishing, and gathering camps, and burial sites; regional interpretive value provides opportunities for scientific study; all sites are eligible for nomination to the National Register of Historic Places as an Archaeological District.
	Historic	Historic Topsy Road, a stagecoach and freight road in its original form, parallels the east side of the river; includes an excellent example of a livery station associated with stage and freight travel; portions of Topsy Road are eligible for nomination to the National Register of Historic Places.
	Scenic	Classified as Scenic Quality A, due to unique landform, diverse vegetation, water, and lack of negative cultural modifications; pronounced canyon is the predominant visual element in the region; scenic beauty combined with cultural heritage draws visitors from outside the region.
	Native American Traditional Use	The canyon is considered by two distinct Native American groups to be sacred and of immeasurable spiritual significance; the other outstandingly remarkable resources in this segment play a significant role in traditional use; the canyon has had continuous use by Native Americans for the last 7,000 years.

Table 3-1. Summary of Outstandingly Remarkable Resources in the Upper Klamath River Study Area (continued)

Segment	Resource	Outstandingly Remarkable Characteristics
3	Recreation	Combined with segment 2, provides a variety of unique late season whitewater opportunities for rafters, canoeists, and kayakers, attracting visitors from outside the region who are willing to travel long distances to experience the quality whitewater run; the 22 Class I-III rapids are considered part of the overall whitewater boating experience; outstanding fishery for wild rainbow trout with an excellent catch rate; substantial shoreline access; year-round fishing season; attracts anglers from throughout the region and beyond.
	Wildlife	Foraging use by a pair of nesting bald eagles; seasonal use by migrating peregrine and prairie falcons.
	Fish	Highly productive, genetically unique wild rainbow trout population; only designated wild rainbow trout river in Siskiyou County; inhabited by Lost River and shortnose suckers (Federal and State endangered) and potentially by Klamath largescale sucker (Federal candidate).
	Historic	1870 Ghost Dance Cult ceremonial site, which is one of five such sites in the region, has potential for additional research; Pokegama log chute, an outstanding example of early logging activity on the Klamath River.
	Scenic	Classified as Scenic Quality A, due to unique landform, diverse vegetation, water, and presence of positive cultural modifications; pronounced canyon is the predominant visual element in the region; scenic beauty combined with cultural heritage and historical features draws visitors from outside the region.

through the upper portion of segment 2, providing several prime fishing spots. Nearly the entire river segment has public access. Currently, the upper Klamath River is one of two major rivers in the region that is open to trout angling year-round (with catch-and-release requirements from June 15 to September 30). The river has a reputation for producing large wild rainbow trout, which draws anglers from outside the region.

Segment 3. Recreational opportunities in segment 3 are also outstandingly remarkable. Whitewater boating in this segment combined with segment 2 provides a variety of unique late-season opportunities. These opportunities are highly valued by boaters, who are willing to travel long distances to experience the quality whitewater run. The 22 Class I-III rapids in the California segment, which allow boaters considerable time to view their spectacular surroundings, are considered part of the overall whitewater boating experience. Combined with segment 2, the upper Klamath River provides both one- and two-day

whitewater boating opportunities, depending on the experience desired, and attracts both private and commercial boaters. Most of the private boaters (rafters, canoeists, and kayakers) are from within the region, whereas most of the commercial rafting outfitters and their clients are from outside the region.

Fishing is considered to be of outstandingly remarkable value. The river provides an excellent trout fishery and is reputed to be one of the better fly fishing rivers in northern California. Like segment 2, this segment of the upper Klamath River also provides a fishery for wild rainbow trout with excellent size and rate of catch, as well as public access, provided by PP&L (map 2-3). The water is calmer than the water in the lower half of segment 2, providing several prime fishing spots. The river has a reputation for producing large wild rainbow trout, which draws anglers from outside the region.

Wildlife

Eligibility Criteria. Criteria were developed for both wildlife populations and their habitat. *Populations:* The river or area within the river corridor contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique or populations of Federally listed or candidate threatened and endangered species. *Habitat:* The river or area within the river corridor provides exceptionally high quality habitat for wildlife of national or regional significance, or may provide unique habitat or a critical link in habitat conditions for Federally listed or candidate threatened and endangered species. Contiguous habitat conditions are such that the biological needs of the species are met (BLM Instruction Memorandum OR-89-632).

Segment 2. The combination of numerous wildlife populations and diverse habitats found within segment 2 is not found elsewhere in the region and qualifies as an outstandingly remarkable resource. Wildlife populations meet the criteria due to the large number of State and Federal listed threatened, endangered, and/or State sensitive (T&E) species that inhabit this segment (table 3-2). The wildlife habitat also qualifies due to its high degree of diversity and importance.

The rich diversity of T&E and other wildlife species found within this relatively small, confined area is unique and cannot be found elsewhere in the region. There are four Federally listed threatened or endangered and two candidate species, nine State listed threatened, endangered, and/or sensitive species, and two Oregon Natural Heritage Database listed species known to occur and an additional six Federal and State listed species potentially occurring within this part of the study area. The following factors are of particular importance in segment 2:

- increasing use of the area by peregrine falcons and the high potential for reoccupation of historic nest sites;
- potential of the study area for peregrine hawk sites or cross fostering with prairie falcons;
- presence of nesting and migrating bald eagles;
- diverse and large number of raptors, particularly the presence of nesting prairie falcons and the five known nest sites;
- golden eagles that forage in and nest near this segment;
- maternity colony of Townsend's big-eared bat, one of only five known colonies in the region; and
- large number of wintering non-game birds, which

provides an important avian prey base to resident and migrating raptors.

Although in itself not outstanding, the presence of the ringtail is a significant feature to the region. In addition, the study area is the easternmost limit of the ringtail cat's range in Oregon.

Wildlife habitat within and surrounding this segment is of exceptionally high quality and diversity, qualifying the area to be outstandingly remarkable in at least a regional context. This is evidenced by the presence and diversity of T&E and other wildlife species inhabiting or migrating through this portion of the study area. The Klamath River Canyon bisects the Cascade Range and cuts through a variety of plant communities, thereby creating the wide diversity of habitats available for wildlife. All five plant communities found in the study area are present in this segment (see Vegetation, chapter 2). The most important habitat features in segment 2 are:

- riverine habitat is important to a wide variety of birds and mammals including bald eagles, osprey, ringtail, and river otters;
- the canyon provides a natural migration corridor for a variety of raptors;
- the extensive rimrock is important raptor nesting habitat;
- large live and dead conifers provide nesting and roosting habitat for bald eagles and osprey;
- caves provide important nursery and roosting habitat for several species of bats; and
- the extensive oak forest and grasslands are important habitat to large numbers of wintering non-game birds.

Segment 3. As in segment 2, the combination of habitats and populations qualifies this segment as an outstandingly remarkable wildlife resource in the region. Most of the discussion on habitat and T&E and other wildlife species for segment 2 applies for segment 3. The use of the aquatic and terrestrial environment by wildlife does not significantly change between the two segments. The habitat and wildlife species found in the two segments represent a continuum of use, although there is a change in the plant communities. Those features exclusive to segment 3 are discussed here.

Wildlife populations found in this segment are similar to those in segment 2 except for a few species. Although there are no known bald eagle, prairie falcon, or osprey nest sites in segment 3, these species are commonly seen within the boundaries. There is an osprey nest located within a few hundred yards of each end of this segment. No known colo-

Table 3-2. Threatened, Endangered, and State Sensitive Fish and Wildlife Found Within the Study Area

Species	Status			Type of Use	Source
	OR	CA	Federal		
Birds					
Bald Eagle	T	E	*	N	BLM
Peregrine Falcon	E	E	E	M, P	ODFW
Northern Goshawk	SS			S, P	ODFW
Northern Pygmy Owl	SS			R	ODFW
Acorn Woodpecker	SS			R	ODFW
Lewis' Woodpecker	SS		FS	R	ODFW
Pileated Woodpecker	SS			ID, P	BLM
Western Bluebird	SS			N	KF
**Western Yellow-billed Cuckoo	SS	E	3B	ID	Littlefield
Mammals					
Fisher	SS			R	KF
Ringtail	SS			R	KF
Townsend's Big-eared Bat	SS		C2	S	BLM
**Wolverine	T	T	C2	R	ODFW
Herptiles					
California Mountain Kingsnake	SS			R	St. John
Western Pond Turtle	SS		C2	R	St. John
**Tailed Frog	SS			R	St. John
**Spotted Frog	SS			R	St. John
**Short-horned Lizard	SS			R	St. John
**Sharptail Snake	SS			R	St. John
Fish					
Lost River Sucker	E	E	E	R	KF
Shortnose Sucker	E	E	E	R	KF
**Klamath Largescale Sucker	SS		C2	R	KF

ABBREVIATIONS USED IN THIS TABLE

- T = Threatened Species
- E = Endangered Species
- SS = State Sensitive Species
- C2 = Federal Candidate Species, Category 2
- N = Nester
- P = Potential Nester
- S = Seasonal
- M = Migrant
- R = Resident
- ID = Insufficient Data
- 3B = Taxa which do not meet Endangered Species Act's legal definition of species; future investigation could lead to reevaluation of the listing qualifications.
- KF = City of Klamath Falls, 1986
- FS = U.S. Fish and Wildlife Service Sensitive Bird Species

*Listed endangered in California and threatened in Oregon.

**Species potentially within or near the study area.

nies of Townsend's big-eared bat exist but they likely forage and possibly roost in this segment. Peregrine and prairie falcons have been sighted in this segment.

The habitat type changes between segments 2 and 3. This transition zone is a critical link in overall habitat use by the T&E species inhabiting the study area and qualifies as outstandingly remarkable. The extensive rimrock found in segments 1 and 2 begins to taper off as the canyon widens out and the rim is further from the river and not as steep. Plant communities are similar to segment 2 except the mixed conifer and pine/juniper types are not found. Pastureland and hayfields are the predominant vegetation types adjacent to the river and more riparian habitat is found in this segment. The pastureland and hayfields provide good foraging habitat for raptors.

Fish

Eligibility Criteria. Criteria were developed for both fish populations and habitat. *Populations:* The river is nationally or regionally one of the top producers of resident and/or anadromous fish species. Of particular significance is the presence of wild or unique stocks, or populations of Federally listed or candidate threatened and endangered species. *Habitat:* The river provides exceptionally high quality habitat for fish species indigenous to the region. Of particular significance is habitat for Federally listed or candidate threatened and endangered species (BLM Instruction Memorandum OR-89-632).

Segment 2. The population of native wild rainbow trout that inhabit this segment qualifies as an outstandingly remarkable resource. The Klamath River is one of three rivers in the region (no others in Siskiyou County) and one of only six in Oregon, designated and managed by the State Department of Fish and Wildlife as a wild rainbow trout fishery. This population is also highly productive, both in terms of high catch rates (of fish up to 20 inches) and reproduction. Additionally, these trout are a naturally spawning population that are genetically unique in being resistant to high pH values; their resistance to a lethal parasite and high summer water temperatures may also be a genetic trait. These are characteristics that are inherent to the Klamath River and have been lethal to non-native trout introduced into the river in the past. The Northwest Power Planning Council also recognized the significance of the wild trout population by designating the upper Klamath River as a Protected Area due to the wild rainbow population. The Lost River and Shortnose suckers, two Federal and State endangered species, potentially inhabit this segment. The Klamath largescale sucker, a Federal

candidate (Category 2) and Oregon State sensitive species, potentially occurs in segment 2.

Segment 3. A combination of fish populations and habitat qualify in this segment as an outstandingly remarkable resource. Although population dynamics are not the same throughout the segments, the wild rainbow trout found throughout segments 1, 2, and 3 represent one population. Consequently, the factors for segment 2 that qualify this population as outstanding also apply for segment 3. As in the Oregon segment, the State Department of Fish and Game has designated and manages the California portion of the Klamath River as a wild rainbow trout area. Two Federal and State endangered species, the Lost River and Shortnose suckers, are found in segment 3. The Klamath largescale sucker, a Federal Candidate (Category 2) species, potentially occurs within this segment.

Segment 3 provides important habitat for the two endangered species, the Lost River and Shortnose sucker. Although these two species are primarily lake dwellers, the Shortnose sucker migrates upstream from Copco Lake to spawn in either the Klamath River or its tributaries. The Lost River sucker has been found in this segment, but spawning has not been documented.

Prehistoric Resources

Eligibility Criteria. The river or area within the river corridor contains a prehistoric site(s) where there is evidence of occupation or use by Native Americans. Sites must be rare, one-of-a-kind, have unusual characteristics or exceptional human interest value(s). Sites may have national or regional importance for interpreting prehistory; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes (BLM Instruction Memorandum OR-89-632).

Segment 2. The prehistoric resources in this segment have been determined to be outstandingly remarkable because of the abundance of sites and their regional interpretive value. A high density of prehistoric sites (40 sites) occur within this 10.2-mile stretch of the river. This demonstrates intense use of the river corridor by Native Americans, and additional research at these sites could further define the prehistory of the river corridor and of this region. These sites include examples of most of the site types available in the region—villages; fishing, hunting, and gathering camps; a quarry site; and burial grounds—and provide the opportunity to more thoroughly recon-

struct prehistoric year-round use of the canyon. A wide array of animal and plant resources have been recovered from some of these sites. This information, combined with the diversity of site types, shows that the canyon was used year-round—an exception in this region, where the distribution of plant and animal resources was usually spread over a wide area and necessitated extensive seasonal movement of people from place to place.

A wide range of artifacts from sites in segment 2 has shown that the river corridor was not the exclusive territory of one tribe, but was used at various times, possibly concurrently, by the Shasta, Modoc, Klamath and perhaps the Takelma. Tribal boundaries appear to have fluctuated within the upper Klamath River Canyon over the last 2,000 years. This is important because the archaeological data shows that territorial boundaries between the different tribes using the canyon did not remain the same through time (an assumption often made about the boundaries of prehistoric culture areas), but changed as each group expanded or decreased its tribal area. These findings raise interesting research questions concerning the timing of these boundary fluctuations, trade relationships between the tribes, and early use of the canyon. The ability to gain additional archaeological data from these sites about prehistoric use of the upper Klamath River Canyon make all of the sites eligible for nomination to the National Register of Historic Places as an Archaeological District. To be eligible for nomination, sites must have yielded, or may be likely to yield, information that is important in prehistory or history (36 CFR 60.4d).

Segment 3. The prehistoric resources in segment 3 have been determined to be significant, but not outstandingly remarkable. Five prehistoric sites have been recorded in this segment by archaeological reconnaissance surveys. The locations of nine additional village sites have been identified by ethnographic research (Theodoratus et al. 1989). This research has also shown concurrent use of the area by the Shasta and Modoc as village sites and burial grounds. Only limited archaeological surveys and research have been conducted on the private property in this segment. Great potential exists for future research to verify the locations of these ethnographic sites and for the interpretation of prehistoric use in the area. This potential to yield important prehistoric or historic information may make all of these sites eligible for nomination to the National Register of Historic Places as part of an Archaeological District.

Historic Resources

Eligibility Criteria. The river or area within the river corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual or one-of-a-kind in the region. A historic site(s) and/or feature(s) in most cases is 50 years old or older. Of particular significance are sites or features listed in, or eligible for, inclusion in the National Register of Historic Places (BLM Instruction Memorandum OR-89-632).

Segment 2. In this segment, sites are primarily associated with Topsy Road, a historic stagecoach/freight road that extends along 5.1 miles of the canyon. This road, completed in 1890, is an outstandingly remarkable example of an early stagecoach and freight road in its original form. Bisecting the Cascade Range, Topsy Road is the only road into the Klamath Basin that was used on a year-round basis. From 1875 until the early 1900's, this road was traveled, even during inclement weather, to bring mail, freight, agricultural goods, and travelers to the Klamath Basin. Most of the original integrity of Topsy Road remains. One exceptional engineering feature of the road, Topsy Grade, is found within segment 2. Topsy Grade is a portion of the road that cuts into a vertical basalt face as the road ascends the rim of the canyon. An excellent example of a livery station associated with stage and freight travel, known as the Way Station, provided year-round services to travelers on the Topsy Road. The two-story log cabin used at this stopover is in good condition and is visible from the road. The presence of this historic site, as well as other sites (Way Cemetery, Kerwin ranch, Frain ranch, and Topsy School) along the road, serve to enhance the historical value of Topsy Road. Portions of Topsy Road are eligible for nomination to the National Register of Historic Places.

Segment 3. One of the known prehistoric villages in this segment appears to have been used after European contact for sacred ceremonies associated with the 1870 Ghost Dance cult (City of Klamath Falls 1985) and is thus considered outstandingly remarkable by BLM Guidelines. This site, CA SIS 1198, has four girdled trees (three are still standing), which are the only visible remains of these religious ceremonies. Standing in the center of the dance grounds, these trees were used to channel energy between the earth and heaven, to accept prayers, and to transform people. There are only four other known Ghost Dance locations (Spier 1927) in this region, all of which are clustered near Upper Klamath Lake. According to Spier (1927), the Ghost Dance cult



Two-story log cabin at the Way Station in segment 2.

spread from the Klamath tribe southward to the California tribes via the Klamath River. This site may have been a part of the southern spread. After additional research to define the full extent of its historic use, this religious site may be eligible for nomination to the National Register of Historic Places.

Another historic feature of segment 3 is the Pokegama log chute. This feature is an outstandingly remarkable example of early logging activities along the Klamath River. The timber industry was a major economic activity along the Klamath River from the late 1800's until the turn of the century. This 2,000-foot wood chute was used to transfer logs from railroad cars above the canyon rim to the Klamath River. At the height of its operation, 300 logs came down the chute each day and 110 men were employed along the river to move the logs to the mill at the town of Klamathon. The location of the log chute is visible as a cut in the rimrock along the western rim of the canyon and as a long trench where it cuts

through the hillside. This historic feature can be seen from Topsy Road near the Klamath Hot Springs and from the Klamath River.

Topsy Road also runs through this segment (6.3 miles), but is considered to be a significant, rather than outstandingly remarkable, feature in segment 3. The road has been improved by Siskiyou County and only a small portion, near the California-Oregon border, resembles the original road. A significant historic feature along Topsy Road in segment 3 was a livery station that later developed into the Beswick Hotel and Klamath Hot Springs Resort. Freight wagon drivers and passengers on the stagecoach would stop overnight at the hotel as they travelled from Ager, California to the Klamath Basin. After its development as a resort and spa, it was visited by noted guests such as President Herbert Hoover, Zane Gray, and Amelia Earhart. Guests at the spa and resort came to use the restorative hot springs, and to fish and hunt. The original hotel and other buildings at the resort are visible from the road and river.

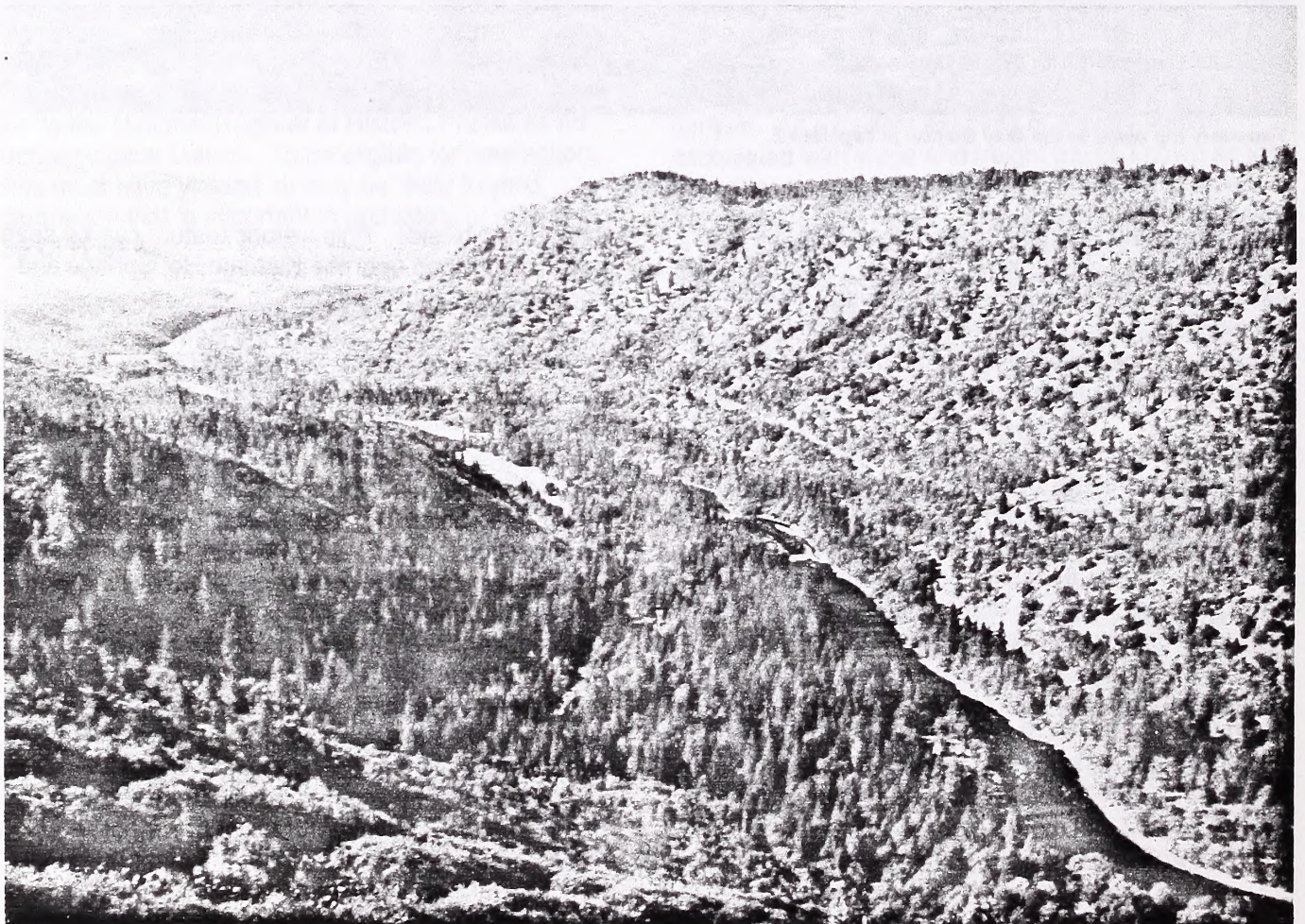
Scenic Resources

Eligibility Criteria. The landscape elements of landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modifications are unique and harmonious. The rating area must be Scenic Quality A as defined in the BLM Visual Resource Inventory Handbook, H-8410-1. When analyzing scenic values, additional factors such as seasonal variations in vegetation, scale of cultural modifications, and length of time that negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment length and not common to other rivers in the geographic region (BLM Instruction Memorandum OR-89-632).

Segment 2. The scenic value of the upper Klamath River Canyon has been classified as Scenic Quality A, BLM's highest scenic classification (BLM 1977). The outstandingly remarkable scenic value is predominantly due to unique landform, diverse vegetation, water, and lack of negative cultural modifications.

The canyon represents a transition from a mountainous to desert landscape as it crosses the Cascade Range, creating the unusual, varied scenery.

The steep-walled, layered basalt canyon is the predominant visual element in the region, as it rises up to 1,000 feet above the river. It cuts across the southeastern corner of the surrounding plateau, exhibiting considerably more landform variety than the plateau, due to its steep canyon slopes with large rock outcroppings in the form of vertical basalt cliffs, talus slopes, and rock slides. Vegetative variety, predominantly ponderosa pine with some oak in this segment, is much more diverse than the surrounding plateau due to the variety of elevations, aspects, and slopes. The Klamath River itself enhances the visual variety in the canyon; as it flows through the deep canyon, it changes from slack, slow-flowing water in the wider areas to a rushing torrent of cascading whitewater through narrow rocky walls making it a dominant factor in the landscape.



Landform variety of the Upper Klamath River Canyon.

Negative cultural modifications, such as roads, powerlines, and developments, are not seen by the casual observer along the river in segment 2. The strong sense of cultural heritage, predominantly from historic Native American use in the area, combined with scenic beauty of the canyon draws visitors from outside the region. The canyon provides exceptional opportunities to view wildlife or wildflowers. The area's remoteness and steep topography provides visitors with uncrowded and natural aesthetic experiences and a strong sense of enclosure, not usually available at the more popular and famous national parks, monuments, and rivers in the region. The scenery compares with the Rogue River's wild and scenic designated sections, although some rating factors, such as landform variety compared to immediate surrounding areas, vegetative diversity, and seasonal color variations, even exceed those on the Rogue.

Segment 3. The scenic value in segment 3 has also been classified as Scenic Quality A by the BLM. The scenic value in this segment is also outstandingly remarkable for similar reasons as those given for segment 2—landform, vegetative diversity, and water. In addition, the presence of positive cultural modifications enhances the scenic value. The unique and diverse landform is characterized by narrow flood plains, steep rock walls, large rock outcroppings, steep angular buttes, and round or flat-topped ridges. Landform variety is much more diverse than that of the surrounding plateau due to steep canyon slopes with rock outcroppings in the form of vertical basalt cliffs, talus slopes, and rock slides. Vegetative variety is more diverse than on the surrounding plateau and is different than that in segment 2. Segment 3 is primarily forested by oak trees and has more grass, reeds, and shrubs than are seen upstream. The Klamath River increases the visual variety of the canyon, as it drops gradually, forming a series of pools and rapids. The canyon widens in segment 3, allowing open views that add to visual variety.

The strong sense of cultural heritage, exhibited in historic ranches and pastures, historic Klamath Hot Springs Resort, and old bridges, combined with the scenic beauty of the canyon, draws visitors from outside the region. The canyon provides exceptional opportunities to view wildlife or wildflowers. The area's remoteness and steep topography provides visitors with an uncrowded and natural aesthetic experience, not usually available at the more popular and famous national parks, monuments, and rivers in the region. The scenery in segment 3 compares with, and sometimes exceeds, the Rogue River's wild and scenic designated sections.

Geologic Resources

Eligibility Criteria. The river or the area within the river corridor contains an example(s) of a geologic feature, process, or phenomena that is rare, unusual, one-of-a-kind or unique to the geographic region. The feature(s) may be in an unusually active stage of development, represent a "textbook" example and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial and other geologic structures) (BLM Instruction Memorandum OR-89-632).

Segment 2. There are some spectacular high basalt and andesite cliffs with columnar jointing, the Salt Caves, localized outcrops of white diatomaceous earth (clay), and landslide features visible from the river; however, they are significant features, and not outstandingly remarkable as compared to similar values in the region.

Segment 3. There are some good examples of columnar basalts, andesites, and weathered tuff cliffs visible from the river. Although these features are scenic, they are neither rare nor unique to the region and therefore are not considered outstandingly remarkable.

Other Similar Values

While no specific evaluation guidelines have been developed for the "other similar values" category, it is assumed that districts will assess other river-related values in a manner consistent with the foregoing guidance—including, but not limited to hydrologic, ecologic/biologic diversity, and scientific study opportunities (BLM Instruction Memorandum OR-89-632).

Segment 2. Native American traditional use in segment 2 has been determined to be an outstandingly remarkable value. This determination is based on statements by the Klamath Tribe and the Shasta Nation and supporting archaeological and ethnographic evidence that the canyon is sacred and of immeasurable spiritual significance. The spiritual importance of the canyon is associated with the preservation of the river and canyon's physical environment, as well as ancestral and current use by tribal members. Encompassed within the canyon are six outstandingly remarkable resources—fish, wildlife, recreational fishing, scenic, prehistoric, and historic values—which form its physical environment. Because spiritual power is invested in the environment, the preservation of these resources as a whole is vital to Native American religion.

With minor fluctuations in territorial boundaries, the canyon has had continuous Native American use for spiritual, cultural, and other activities. The canyon is used by members of two very distinct groups, the Klamath Tribe and the Shasta Nation, for such spiritual activities as vision quests, curing ceremonies, and spiritual preparation; and for cultural activities including fishing, hunting, gathering, and education. The canyon was also used by ancestors of both groups for burial sites. These burial sites contribute to the spiritual significance of the canyon because they are places where spiritual leaders or individuals can prepare for specific religious and medicinal ceremonies or communicate with the Great Creator (Hall 1985). Use of the canyon goes back at least 7,000 years; artifacts recovered from prehistoric sites indicate that ancestral members of the Shasta, Modoc, and Klamath were among the earliest users of the canyon.

It has been determined that besides the Native American traditional use, there are no values other than those previously mentioned in segment 2 that are outstandingly remarkable. The water quality occasionally does not meet Oregon State water quality standards and therefore is not considered either an outstanding or a significant value. The ecologic/biologic diversity is at least regionally significant, and supports the diversity of wildlife described in the wildlife and fish sections of this chapter. This is due in part to the fact that the Klamath River bisects the Cascade Range. There are significant opportuni-

ties for scientific study of the prehistoric values in this segment, which are discussed in the Prehistoric section in this chapter.

Segment 3. Native American traditional use in segment 3 has been determined to be significant, but not outstandingly remarkable. Although many resources—fish, wildlife, fishing, scenic, prehistoric, and historic values—exist in this segment that contribute to traditional uses, most statements made by Native Americans about their use of the river and canyon refer to segment 2. This corresponds to the greater density of archaeological resources in segment 2. The greater proportion of private property and associated agricultural activities in this segment limits accessibility to important resources and diminishes the sense of solitude necessary for continued performance of many traditional spiritual and cultural activities.

There are no values other than those previously mentioned in segment 3 that are outstandingly remarkable. The water quality occasionally does not meet California State water quality standards so it is not considered either an outstanding or a significant value. The ecologic/biologic diversity is at least regionally significant, and supports the diversity of wildlife described in the wildlife and fish sections of this chapter. This is due in part to the fact that the Klamath River bisects the Cascade Range. There are significant opportunities for scientific study of historic (specifically the Ghost Dance site) values, which are discussed in the Historic section in this chapter.

Chapter 4 – Classification



Protected cliff habitat in segment 1.

Introduction

This chapter discusses the three classification categories used for eligible rivers or river segments (wild, scenic, recreational); the criteria considered for each classification category; and the classification determination of segments 2 and 3 of the upper Klamath River. Segment 1, as discussed in chapter 3, was determined to be ineligible; however, its highest potential classification is summarized in this chapter for report completeness and information purposes.

After determining a river's eligibility for inclusion in the National Wild and Scenic River System, it must be classified according to the category—wild, scenic, or recreational—that best fits each eligible segment. These terms can be misleading—a “scenic” river may have been designated for reasons other than scenery, and a “recreational” river doesn't necessarily have outstandingly remarkable recreational resources. Classification is based on the degree of naturalness and extent of development of the river and its adjacent lands as they exist *at the time of the study*.

Classifying a study river as wild, scenic, or recreational does not segregate or withdraw the subject lands, but rather recommends a level of interim management for Federal lands in the study area until a decision on designation is made by Congress. Guidance provided in the 1982 Final Revised Guidelines for Eligibility, Classification, and Management of River Areas will be used for interim management. If Congress designates a river or river segment, it will be managed according to how it is classified. Congress may classify a river segment at or below the highest level for which it qualifies. Specific management strategies may vary according to classification, but would be designed to protect and enhance the outstandingly remarkable values of the river area. These specific management strategies are formulated during development of the management plan, required within three full fiscal years of designation (Section 3(d)(1), Wild and Scenic Rivers Act).

Classification Categories

The three classification categories for eligible rivers are defined in Section 2(b) of the 1968 National Wild and Scenic River Act as:

- (1) **Wild river areas**—Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

- (2) **Scenic river areas**—Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- (3) **Recreational river areas**—Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

A wild river would be a very undeveloped river with limited access. A scenic classification would be applied to a river or river segment that is more developed than a wild river and less developed than a recreational river. A recreational classification would be appropriate in developed areas, such as where a river runs parallel to roads or railroads with adjacent lands that have agricultural, forestry, commercial, or other developments, provided that the waterway remains generally natural and riverine in appearance.

Classification Criteria

Water quality, water resources development, shoreline development, and accessibility are the criteria that are considered when determining classification. Each criterion is important, but their collective intent is more important. Although each classification permits existing development, the criteria do not imply that additional inconsistent development is permitted in the future. Developments that are compatible with designation would be allowed, provided they are carried out in an environmentally sound manner. Table 4-1 describes the criteria of each classification category in greater detail.

Classification Determination

Segments 1, 2, and 3 do not meet all the criteria for a wild classification—water quality does not always meet or exceed Federal criteria, shorelines do not appear to be essentially primitive with little or no evidence of human activity, and all segments are accessible by road within the river area. Segment 1 does not meet all the criteria for a scenic classification because of the water resource and shoreline developments; therefore, discussion for segment 1 refers only to recreational classification criteria (table 4-1). Classification determinations for segments 2 and 3 were made using the criteria established for scenic and recreational classification.

Table 4-1. Classification Criteria for Wild, Scenic, and Recreational Rivers

Attribute	Wild	Scenic	Recreational
Water Quality	Meets or exceeds federal criteria or federally approved state standards for aesthetics, for propagation of fish and wildlife normally adapted to the habitat of the river, and for primary contact recreation (swimming) except where exceeded by natural conditions.	No criteria prescribed by the Wild and Scenic Rivers Act. The Clean Water Act of 1977 made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable federal and state laws.	
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundments or diversion. The existence of low dams, diversions or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural values, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.

Table 4-1. Classification Criteria for Wild, Scenic, and Recreational Rivers (continued)

Attribute	Wild	Scenic	Recreational
Accessibility	Generally inaccessible except by trail. No roads, railroads, or other provisions for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.

Source: Final Revised Guidelines for Eligibility, Classification, and Management of River Areas. Federal Register, September 7, 1982.

Segment 1

Segment 1 was determined to be ineligible for inclusion in the NWSRS; however it is briefly discussed here for the reader's information. Construction of the above-ground flume and access road between the J.C. Boyle Dam and Powerhouse resulted in substantial modification of portions of the west river bank. Portions of the west side are now fill-slope with the toe of the slope stabilized using large boulders, which have altered the natural appearance of the waterway. Spillway construction in segment 1 and placement of large basalt boulders on the west river bank to prevent erosion when water is released from the spillway also resulted in modifications of the waterway.

Shoreline developments in segment 1 include 638 feet of 14-foot diameter steel pipe that crosses the river below the J.C. Boyle Dam, 2.1 miles of concrete flume that parallels the river, a concrete forebay, a 56-foot surge tank above two 958-foot steel penstocks, a two-generator power plant, and a corrugated steel storage building.

A wooden bridge crosses the river below the J.C. Boyle Dam providing access from the east side of the river to the 2.1-mile graveled flume maintenance access road that runs adjacent to the flume. The J.C. Boyle Powerhouse access road enters the study area in segment 1 at RM 223, intersects the highly visible

flume maintenance road at RM 222.5, and travels along the west side of the canyon where it is partially screened by trees.

Segment 1 does not meet the criteria for water resources development because the waterway does not appear natural and riverine from the major modifications to it; however, this portion of segment 1 does meet the criteria for water quality, shoreline development, and accessibility under the recreational classification set forth in the Wild and Scenic Rivers Act (table 4-1).

Segment 2

This portion of the upper Klamath River is relatively unpolluted, but Federally-approved State water quality standards, set by the Oregon Department of Environmental Quality for water in the Klamath River, are occasionally not met. This is especially apparent during periods of low summer flow, when water quality upstream from the study area also does not meet Federal standards (see Water Resources in chapter 2 for further discussion). The water within the study area is of sufficient quality to support the river corridor's outstandingly remarkable values. Water quality for scenic or recreational rivers is not required to continually meet or exceed Federally-approved State standards; therefore, the current water quality of the upper Klamath River does not affect its qualification for inclusion in the NWSRS.



Rock irrigation diversion in segment 2.

The State has primary responsibility to prevent, reduce, or eliminate pollution and is currently developing water quality assessment plans and control strategies for those waterbodies that are either not meeting or suspected of not meeting water quality standards and thus not supporting beneficial uses. As part of these studies, Oregon DEQ (1988) is establishing total maximum daily loads (TMDLs) for municipalities and industries discharging effluent into the Klamath River. This serves as the water quality improvement plan mentioned in table 4-1.

Minor rock irrigation diversions (low rock walls that stretch from the shoreline to the center of the river channel and in some instances across the river) are the only water resources developments present in this segment. Water flows freely across these rock walls, even at low flow, and they do not contrast negatively with the surrounding landscape. No other water resources developments are present in segment 2.

Short stretches of two dirt roads are visible on either side of the river; however, both roads are generally well screened from view by topography and vegetation. A raft launch area, semi-primitive campsite, several primitive campsites, and remnants of historic activities are visible, but not obvious, from the river. The only buildings visible from the river are three duplexes and an electric power substation adjacent to

the powerhouse, and an aesthetically appealing historic log cabin, which is partially screened from view. A USGS gaging station, composed of a cable strung across the river, a cable car, and a small building that houses the measuring equipment, is visible along a short reach of the river. Limited livestock grazing occurs on floodplains next to the river. A wood pole powerline that is mostly screened from view by vegetation and topography parallels the upper portion of this segment. A small substation, situated above the immediate river environment, is visible for a short reach of the river in the lower part of segment 2.

The river is accessible in places by road, but these roads do not cross the river. These roads are essentially inconspicuous and well-screened from view. Where roads are visible from the river, they are limited to short stretches that are, for the most part, away from the immediate river environment. Primary use of these roads is for recreational activities and access by land owners.

Using the criteria set forth in the Wild and Scenic Rivers Act, segment 2 meets the criteria for a scenic classification (table 4-2). The northern 0.1-mile of segment 2 barely meets the scenic classification criteria for shoreline development, however the remainder of this segment meets or exceeds this

Table 4-2. Upper Klamath River Classification Summary

Criteria	Segment 2	Segment 3
WILD		
Water Quality		
Meets or exceeds Federal Criteria or Federally approved State standards	Doesn't Meet	Doesn't Meet
Water Resource Developments		
Free of Impoundments	Meets	Meets
Shoreline Development		
Essentially primitive with little or no evidence of human activity	Doesn't Meet	Doesn't Meet
A few inconspicuous structures	Meets	Meets
Limited livestock grazing or hay production	Meets	Doesn't Meet
Little or no evidence of past timber harvest and no ongoing timber harvest	Meets	Meets
Accessibility		
Inaccessible except by trail	Doesn't Meet	Doesn't Meet
No roads or railroads within the river area	Doesn't Meet	Doesn't Meet
SCENIC		
Water Quality		
No criteria prescribed by the Wild and Scenic Rivers Act (see table 4-1)	Meets	Meets
Water Resource Developments		
Free of impoundments	Meets	Meets
Shoreline Developments		
Largely primitive and undeveloped with no substantial evidence of human activity	Meets	Meets
Presence of small communities, dispersed dwellings or farm structures	Meets	Meets
Livestock grazing or hay production	Meets	Meets
Evidence of past or present timber harvest, but the forest appears natural from the riverbank	Exceeds	Exceeds
Accessibility		
Accessible in places by road	Meets	Meets
Roads may occasionally reach or bridge the river	Meets	Meets
Existence of short stretches of conspicuous road or longer stretches of inconspicuous road or railroad within the river area	Meets	Meets

Table 4-2. Upper Klamath River Classification Summary (continued)

Criteria	Segment 2	Segment 3
RECREATIONAL		
Water Quality		
No criteria prescribed by the Wild and Scenic Rivers Act (see table 4-1)	Meets	Meets
Water Resource Development		
Some existing impoundments, low dam diversions, or waterway modifications, provided the waterway remains generally natural and riverine in appearance	Exceeds	Exceeds
Shoreline Development		
Some development and substantial evidence of human activity	Exceeds	Exceeds
Presence of extensive residential development and a few commercial structures	Exceeds	Exceeds
Developed for a full range of agricultural and forestry uses	Exceeds	Exceeds
Evidence of past and ongoing timber harvest	Exceeds	Exceeds
Accessibility		
Readily accessible by road or railroad	Exceeds	Exceeds
Parallel roads or railroads on one or more banks, as well as bridge crossings and other river access points	Exceeds	Exceeds
Meets—Meets the criteria for this classification Doesn't Meet—Does not meet the criteria for this classification Exceeds—Exceeds the criteria for this classification		

criteria. Excluding the northernmost portion, this segment is free of impoundments, the shoreline is still largely primitive and undeveloped, no substantial evidence of human activity is present, and it is accessible in places by dirt roads.

Segment 3

This portion of the upper Klamath River is relatively unpolluted, but Federally-approved State water quality standards, set by the California State Water Resources Control Board, are occasionally not met. This is especially apparent during periods of low summer flow, when water quality upstream from the study area also does not meet Federal standards (see Water Resources in chapter 2 for further discussion).

The water within the study area is of sufficient quality to support the river corridor's outstandingly remarkable values. Water quality for scenic or recreational rivers is not required to continually meet or exceed Federally-approved State standards; therefore, the current water quality of the upper Klamath River does not affect its qualification for inclusion in the NWSRS.

Several minor rock irrigation diversions (low rock walls that stretch from the shoreline to the center of the river channel) are the only water resource developments present in this segment. Water flows freely across these rock walls, even at low flow, and they do not contrast negatively with the surrounding landscape. No other water resource developments are present in segment 3.

A single wood pole powerline and Topsy Road, mostly screened from view by vegetation, parallel the river. Structures on the two operating cattle ranches within this portion of the river are usually screened from view. When seen, they are aesthetically appealing because of their rustic appearance. Livestock grazing and limited hay production occur on the floodplains next to the river. Six designated fishing access points (five in segment 3 and one downstream of the boundary) with parking areas and toilets on private property are provided by Pacific Power & Light Company. These gated access points are along the road and are not visible from the river. The two low-profile wooden bridges that cross the river do not deviate from or contrast negatively with the surrounding landscape and are only used by the two ranches in segment 3.

The east side of the river is accessible by road. Although Topsy Road parallels the entire length of segment 3, it is inconspicuous and well-screened from the river. Access is primarily limited to the fishing access points on private property. Primary use of this road is for recreational activities and access by land owners.

Using the criteria set forth in the Wild and Scenic Rivers Act, segment 3 meets the criteria for scenic classification (table 4-2). This segment is free of impoundments, the presence of grazing and hay production is acceptable, the shoreline is still largely primitive and undeveloped, dispersed dwellings or farm structures are acceptable, bridges are permitted, and the river is accessible in places by a road.



Ranch structure in segment 3.

Chapter 5

Suitability



Irrigated pasture in segment 3.

Introduction

This chapter discusses the suitability of the upper Klamath River for inclusion in the National Wild and Scenic Rivers System. As discussed in chapter 3, segment 1 is not considered to be free-flowing; therefore, it is not eligible for inclusion in the NWSRS. As discussed in chapters 3 and 4, segments 2 and 3 were determined eligible for inclusion to the NWSRS with a scenic classification. The next step is to determine if they are suitable for inclusion. The guidance used to determine the suitability of the upper Klamath River is from the Wild and Scenic Rivers Act and BLM Guidelines (OR-88-670). The BLM Guidelines come directly from section 4(a) of the Act, which specifies:

*** Each report, including maps and illustrations, shall show among other things the area included within the report; the characteristics which do or do not make the area a worthy addition to the system; the current status of land ownership and use in the area; the reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the national wild and scenic rivers system; the Federal agency (which in the case of a river which is wholly or substantially within a national forest, shall be the Department of Agriculture) by which it is proposed the area, should it be added to the system, be administered; the extent to which the costs thereof, be shared by State and local agencies; and the estimated cost to the United States of acquiring necessary land and interests in land and of administering the area, should it be added to the system.

Each element in section 4(a) is addressed in this chapter, but not in the order listed above.

Suitability of the upper Klamath River is determined from a discussion of three major factors: 1) existing situation, 2) alternative management strategies, and 3) reasonably foreseeable potential effects. The existing situation, summarized from chapters 1 and 2, is discussed in terms of its compatibility with designation of the river under the Wild and Scenic Rivers Act. Existing situation consists of ownership, management, and uses of the land and water; protection of the outstandingly remarkable values; and those factors that cause the river to be a worthy addition to the National system.

The possible management strategies provide the reader with an idea of land ownership and manage-

ment, land use restrictions, and protection of the outstandingly remarkable values for each of the three strategies. The strategies are continuation of current management, current management intensified, and designation of the upper Klamath River. A comparison is then made between the alternative management strategies in three areas: the ability of the BLM to manage the river corridor, restrictions on land uses, and protection of the outstandingly remarkable values. If the BLM were able to manage the land and resources in the river corridor, existing and reasonably foreseeable land uses and activities were generally beneficial or unaffected, and the outstandingly remarkable values were protected to the greatest extent possible with designation in comparison to other potential situations (including the current situation), then the river would be suitable for inclusion in the NWSRS.

Each of the three alternative management strategies could cause an array of potential effects. The potential effects of designation on the ownership, management, and uses of the lands; the outstandingly remarkable resource values; and water rights and quality could affect the suitability of the river for inclusion in the NWSRS. These potential effects of designation are compared with the continuation of current management.

Existing Situation

This section of the chapter discusses various aspects of the existing situation, determines their compatibility with designation, and based on those determinations, concludes if the river is suitable for inclusion. Those aspects of the existing situation, summarized from chapters 1 and 2, are land ownership and use, administering agencies and laws and regulations, resource classifications, historical and existing rights, and characteristics which do or do not make the area a worthy addition to the National Wild and Scenic Rivers System. If the majority of these aspects are compatible with designation, then with regards to the existing situation, the river is suitable for inclusion in the NWSRS.

Land Ownership and Use

Ownership. Land ownership in the study area is shown in map 2-1 and table 2-1. Seventy-five percent of segment 2 is owned and administered by the BLM, 23 percent is privately owned, and 2 percent is State (Oregon). Segment 3 is 87 percent private, 11 percent BLM, and 2 percent U.S. Forest Service. In addition, the bed and banks of the Klamath River in segment 2 are claimed by the State of Oregon

(ownership of the bed and banks in segment 3 has not been determined at this time). Private land would remain in private ownership unless a landowner willingly donated, exchanged, or sold easements or fee title to the Federal or State government. The relatively large percentage of Federal land in the Klamath River Canyon is compatible with its suitability for designation because the BLM has management authority over and would continue to manage a considerable portion of the canyon under the Wild and Scenic Rivers Act if it were designated. Therefore, the current ownership pattern creates no need for acquisition in segment 2. This is also compatible with designation, both in terms of minimal land acquisition cost to the Federal government and little or no effect on private ownership.

Use. Land uses in the study area, described in chapter 2, include hydroelectric energy generation and transmission, recreation, wildlife habitat management, Native American traditional use, timber harvest, livestock grazing, and agriculture. Water releases from the J.C. Boyle Powerhouse during hydroelectric energy generation enhances the value of whitewater rafting, which, along with other recreational opportunities, is an outstandingly remarkable value. The Klamath River Canyon ecosystem is managed for wildlife, another outstandingly remarkable value. The Native American traditional use of the canyon is a unique outstandingly remarkable value. Those four uses are compatible with, and would be enhanced by, designation. Designation would have little or no effect on timber harvest, livestock grazing, and agricultural practices and consequently would neither increase nor decrease the suitability of the river for designation.

Historical and Existing Rights

Rights, as used in this section, include rights-of-way, water rights, Native American rights, grazing leases, special recreation use permits, and mineral rights. Rights-of-way for three powerlines and four roads, summarized in table 2-2, currently affect 259 acres of Federal land in the study area. Within segment 2, Pacific Power and Light owns three water right claims for less than 1 cfs of Klamath River water and the Oregon Department of Forestry has a water permit to use 10,000 gallons of water per day from a tributary of the Klamath River near the Topsy Road. Within segment 3 there are no water use applications or claim of rights on file. Native American rights, which include access to religious sites and the freedom to worship through ceremonies and traditional rites, are protected and preserved in the study area by the American Indian Religious Freedom Act of 1978. Two grazing leases in segments 2 and 3 affect 3,040 acres

of public land and 980 acres of private land. Only 200 acres of public grazing leases are in segment 3, the rest are in segment 2. In 1989, the BLM issued 21 annual special recreation use permits for whitewater rafting and associated activities (video and still photography). No mineral claims are present in the study area. The rights-of-way, water rights, grazing leases, special recreation use permits, and mineral rights have no effect on the suitability of the upper Klamath River and would be compatible with designation. Designation would support Native American rights.

Administering Agencies and Laws and Regulations

Administering Agencies. The BLM is the major Federal land administering agency in the Klamath River Canyon; the BLM's Klamath Falls Resource Area manages segment 2 and its Redding Resource Area manages segment 3. The Oregon State Parks and Recreation Department administers the Klamath Scenic Waterway (1/4-mile from each bank of the river in segment 2) in cooperation with the BLM. State and local governments administer regulations on private lands in segments 2 and 3. No change in administering agencies would result if the river were designated. The BLM has been managing the river corridor to protect the outstandingly remarkable values and would have the ability to continue managing segments 2 and 3 by providing long-term protection of the river's values under the Wild and Scenic Rivers Act in cooperation with appropriate State and local agencies. The suitability of the upper Klamath River for inclusion in the NWSRS is compatible with the current cooperative administration of the canyon.

Administering Laws and Regulations. Land management agencies operate under or are consistent with several laws. The most applicable of these laws and regulations in the canyon and how they affect suitability are listed in table 5-1. The State Scenic Waterways Act and the Klamath River Basin Compact are two of the more significant authorities and are discussed in the following paragraphs relative to their effect on the suitability of the river.

The Oregon Comprehensive Waterway Management Plan was implemented to improve, develop, and conserve Oregon's waterways. This plan addresses the needs and uses of all Oregon rivers and reflects a balancing of the competing uses of Oregon waterways. It consists of a broad range of elements including statutes, administrative rules, and planning and/or management documents that may be applicable statewide or to a specific basin, stream reach, or waterway use. The plan summarizes the various

Table 5-1. Federal, State, and Local Plans and Legislation and Their Relation to Suitability

Legislation	How it Relates to Klamath River Canyon or Wild and Scenic Designation	+ positive factor - negative factor 0 no effect
		How it Applies to Suitability of the Upper Klamath River
Federal Land Policy and Management Act of 1976	Projects present and future multiple use management of public lands and their resources through land use plans that are coordinated with other Federal, State, and local planning efforts. Affects 2,150 acres in segments 2 and 3 (510 in segment 1).	0
National Environmental Policy Act of 1969	Instructs Federal government to use all practicable means and measures to create and maintain conditions under which man and nature can exist in productive harmony.	0
Oregon & California Sustained Yield Act of 1937	Sustained yield for purpose of providing a permanent source of timber supply, protecting watersheds, regulating streamflow, etc. Affects 2,720 acres in segment 2 (790 in segment 1)	0
Archaeological and Historic Preservation Act of 1974	Provides for the protection of historical and archaeological data on Federal and private property in the Klamath River Canyon, which might be lost as the result of any Federal construction project or program.	+
Antiquities Act of 1906	Protects historic and prehistoric sites on Federal property in the Klamath River Canyon from illegal excavation or destruction.	+
National Historic Preservation Act of 1966 as amended in 1976	Encourages Federal involvement in the preservation of non-federally owned prehistoric and historic resources in the Klamath River Canyon by such methods as development of cooperative agreements.	+
American Indian Religious Freedom Act of 1978	Protects and preserves the rights of Native Americans to use the Klamath River Canyon for religious purposes; this includes access to sacred sites and the freedom to worship at these sites through ceremonials and traditional rites.	+

Table 5-1. Federal, State, and Local Plans and Legislation and Their Relation to Suitability (continued)

Legislation	How It Relates to Klamath River Canyon or Wild and Scenic Designation	How it Applies to Suitability of the Upper Klamath River
Executive Order 11593 of 1971	Assures that Federal plans or programs for the Klamath River Canyon will contribute towards the preservation and enhancement of privately owned sites, structures, and objects of historical, architectural or archaeological significance; such as the development of cooperative agreements to protect prehistoric sites in segment 2.	+
Federal Water Pollution Control Act (Clean Water Act) of 1977)	To restore and maintain "the chemical, physical, and biological integrity of the Nation's water" at a level of quality which provides protection for fish, shellfish, wildlife, and recreational use.	+
Klamath River Basin Compact of 1957	Specifies use and distribution of water in the Upper Klamath River Basin.	0
Water Quality Act of 1987 (Amendments to Federal Water Pollution Control Act)	Authorizes funding for water pollution control projects and studies of water pollution problems; establishes a program to manage nonpoint sources of pollution by authorizing funds to States to prepare reports and plans on waters that are not expected to meet desired water quality goals.	+
Soil and Water Resource Conservation Act of 1977	Conservation, protection, and enhancement of soil, water, and related resources for sustained use.	+
Executive Order 11990 of 1977, Protection of Wetlands	Minimize destruction and degradation of wetlands and to preserve and enhance values of wetlands.	+
Public Rangelands Improvement Act of 1978	Improving condition of public rangelands. Improvements include any program to provide water, stabilize soil and water conditions, and provide habitat for livestock and wildlife.	+
Taylor Grazing Act of 1934	To study erosion control and develop improvements necessary to maintain increased water supply.	0

Table 5-1. Federal, State, and Local Plans and Legislation and Their Relation to Suitability (continued)

Legislation	How it Relates to Klamath River Canyon or Wild and Scenic Designation	How it Applies to Suitability of the Upper Klamath River
Endangered Species Act of 1973	Requires all Federal departments and agencies to utilize their authorities to conserve species listed by the Secretary of the Interior as threatened or endangered and to ensure that the continued existence of listed species is not jeopardized and that designated critical habitat of listed species is not destroyed or adversely modified.	+
Migratory Bird Treaty Act of 1918	Establishes Federal responsibility for the protection of international migratory bird resources, and gives the Secretary of the Interior (FWS) authority to regulate hunting of migratory birds. Amended to provide for habitat protection and enhancement of protected migratory birds.	+
Bald Eagle Protection Act of 1940	Establishes penalties for taking, possessing, selling, purchasing, bartering, and certain other actions pertaining to bald and golden eagles. Provides for the cancellation of leases, permits or other agreements authorizing livestock grazing on Federal lands of persons convicted of violating the Act.	+
The Fish and Wildlife Coordination Act of 1958	Directs that wildlife conservation be given equal consideration and be coordinated with other features of water-resource development programs, and requires that possible damage to fish and wildlife resources, from work planned in navigable waters and drainages, be assessed and that measures be adopted for preventing such losses or damages as well as for development and improvement of wildlife and fisheries resources.	+
Sikes Act of 1974	Provides for the conservation, restoration, and management of species and their habitats in cooperation with State wildlife agencies, including establishment of a hunting and fishing stamp program with revenues to be spent upon lands on which fees are collected.	+

Table 5-1. Federal, State, and Local Plans and Legislation and Their Relation to Suitability (continued)

Legislation	How it Relates to Klamath River Canyon or Wild and Scenic Designation	How it Applies to Suitability of the Upper Klamath River
Wild Free-Roaming Horse and Burro Act of 1971	Requires that management activities for wild horses and burros be carried out in consultation with State wildlife agencies in order to protect the natural ecological balance of all wildlife species inhabiting the land, particularly endangered wildlife.	+
BLM Jackson-Klamath Management Framework Plan of May 1980	Provides for multiple use management of resources in segment 2.	+
BLM Redding Management Framework Plan of December 1982	Provides for multiple use management of resources in segment 3.	+
Oregon Comprehensive Waterway Management Plan (1988)	Addresses the needs and uses of all Oregon rivers and reflects balancing of competing uses of Oregon waterways.	0
Scenic Waterways Act (revised 1988)	Requires prior approval of managing (State) agency for site-specific land use activities on all lands within 1/4-mile of the river banks of a State Scenic Waterway. This applies to segment 2.	+
Klamath County Comprehensive Plan	Provides for land uses and developments on private land in segment 2 to be related to forest management.	-
Siskiyou County Comprehensive Plan	Provides for land uses and developments on private land in segment 3 to be related to agricultural enterprises or timber growth and harvest.	+

State agency roles and responsibilities with respect to water resources management. The Water Resources Commission was assigned the lead role in planning and managing the state waterways through the specific agencies that are charged with implementing various aspects of the plan. The plan's most relevant aspect to the study area is the Oregon Scenic Waterways Program. The upper Klamath River, from the J.C. Boyle Powerhouse to the Oregon-California

border, is a component of the Oregon Scenic Waterways Program in accordance with the Scenic Waterways Act (ORS 390.805 to 390.925) and Oregon Administrative Rules (OAR 736-40-005 to 736-40-095).

Under the Scenic Waterways Act, changes in existing land use activities on lands within 1/4-mile of each river bank in segment 2 must be reviewed by the

appropriate State managing agency. The State Act also specifies that the free-flowing character of State Scenic Waterways will be maintained in quantities necessary for the highest and best uses of the river, which are recreation, fish, and wildlife (ORS 390.835). State rules for land management can be found in the Oregon Administrative Rules. Appendix H describes management rules and guidelines for Oregon Scenic Waterways without adopted management plans, such as for the Klamath Scenic Waterway. The Klamath Scenic Waterway is compatible with, and would be augmented by, designation of the upper Klamath River.

The Klamath River Basin Compact, discussed in chapters 1 and 2, is an interstate agreement between California and Oregon, which provides a comprehensive plan to guide water use and development in the Klamath Basin. The Klamath River Basin Compact does not impair the suitability of the upper Klamath River for designation under the Wild and Scenic Rivers Act. Nothing in the Compact prohibits such designation of the river. While Article III B of the Compact calls for a priority of water uses, recreational use (including use for fish and wildlife) is recognized as a beneficial use under the Compact. Any water right associated with designation could only be granted and administered in a manner consistent with both the provisions in section 13 of the Wild and Scenic Act and the terms of the Compact. In sum, Congress has provided the necessary guidance for integrating management of wild and scenic rivers with existing State water laws and interstate compacts.

Resource Classifications

Various portions of the upper Klamath River have classifications applied to them based on significant resource values (table 5-2). These classifications were developed by the BLM, State (Oregon and California) agencies, Klamath County, Northwest Power Planning Council, and the Pacific Coast American Peregrine Falcon Recovery Team (specialists from various State and Federal wildlife agencies). All the resource classifications, except for the Federal power withdrawals, protect or provide for values deemed outstandingly remarkable and would be strengthened by designation of the upper Klamath River. The power withdrawals, predominantly in segment 2, are compatible with designation, and neither enhance nor detract from the suitability of the river.

Characteristics Which Do or Do Not Make The Area a Worthy Addition to the System

The outstandingly remarkable values, described in chapter 3, make the upper Klamath River a worthy addition to the National Wild and Scenic Rivers System. The values that are either comparable to or more significant than those same values found on other designated rivers in the National Wild and Scenic Rivers System are described as follows:

- The upper Klamath River is one of only three rivers that crosses the Cascade Mountain range and represents a transition from mountainous to desert landscape. As a result, the scenery of the upper Klamath River compares with, and sometimes exceeds, that of the Rogue River's designated wild and scenic sections.

- Native American traditional use, not represented by other rivers in the National System, is one of the upper Klamath River's most unique outstandingly remarkable values. At least two distinct groups of Native Americans—the Klamath Tribe and the Shasta Nation—have continually used the river corridor for 7,000 years. Preservation of the river's ecosystem, as well as ancestral and current use by tribal members—predominantly for spiritual and cultural activities—are important aspects of Native American traditional use of the Klamath River Canyon.

- The density of prehistoric sites, some dating back 7,000 years, is comparable with those found along the John Day River, which was added to the NWSRS in 1988.

- The upper Klamath River is a classic example of a short, highly technical whitewater rafting run. It has more technical rapids (class IV-V) concentrated within a short stretch of river than either the Lower Klamath or Rogue rivers, the two closest designated rivers in the region that provide whitewater rafting. Class IV and V rapids can be experienced on the upper Klamath River in the late summer and early fall when the Owyhee and Illinois rivers are unrunnable because of low water, and when access is limited on the Rogue River because of its very restrictive permit system. The Owyhee and Illinois rivers are two of only three other designated rivers in Oregon with class IV-V rapids.

Table 5-2. Existing Resource Classifications on the Upper Klamath River

			+ positive effect on suitability - negative effect on suitability 0 no effect on suitability
CLASSIFICATION	PURPOSE	SUITABILITY	
BLM			
Klamath River Special Recreation Management Area (map 2-3)	Provides semi-primitive motorized recreational opportunities in segment 2.	+	
Visual Resource Management Class II and Scenic Class A	Preserves existing character of the landscape in segments 2 and 3.	+	
Klamath River Prescription Area	Provides roaded natural experience opportunities in segment 3.	+	
Federal Power Withdrawals	Withholds certain parcels of public land in segments 2 and 3 from disposal under public land laws.	0	
State Fish and Game Agencies			
Wild Rainbow Trout Stream	Protects stocks of resident rainbow trout in segment 2.	+	
Wild Rainbow Trout Area	Protects stocks of resident rainbow trout in segment 3.	+	
State of Oregon			
Klamath Scenic Waterway	Protects scenic, fishery, wildlife, and recreational values in segment 2.	+	
Klamath County			
Significant Resource Area	Protects and preserves hydro energy, potential scenic waterway, fish and wildlife, and cultural resources in segment 2 for present and future generations.	+	
Northwest Power Planning Council			
Protected Area	Protects resident fish (rainbow trout) and wildlife (black-tailed deer) in segment 2.	+	
Pacific Coast American Peregrine Falcon Recovery Team			
Peregrine Falcon Management Unit	Protects historic peregrine nest site in segment 2 and habitat in segment 3 that is part of a large area that has a minimum number of active breeding falcon pairs as a recovery goal.	+	

-Wild rainbow trout fishing on the upper Klamath River is rivaled in Oregon only by the Deschutes River, which is in the NWSRS.

-Fifteen Federal and State threatened or endangered and State sensitive species are found within the river corridor. Four of these are Federal threatened or endangered fish and wildlife species. No other designated river in the region (Jackson, Josephine, Klamath, and most of Douglas counties in Oregon and Siskiyou County in California) has this concentration of Federal threatened or endangered animals.

In addition to each individual value, the combination of the outstandingly remarkable values, each at a remarkable level and concentrated within such a small area, causes the upper Klamath River and its ecosystem to be a unique contribution to the National system. These values clearly enhance the suitability of the river, and their protection would be complemented by designation under the Wild and Scenic Rivers Act.

Summary

Existing land ownership, land uses, rights, management, authorities, resource classifications, and resource values in the canyon would all be compatible with designation of the upper Klamath River under the National Wild and Scenic Rivers Act. Some developments, such as new hydroelectric facilities, would not be compatible with designation. The land ownership pattern, State Scenic Waterways designation, and presence of many diverse outstandingly remarkable values enhance the upper Klamath River's suitability for inclusion in the NWSRS.

Alternative Management Strategies

A comparison of alternative management strategies is necessary to indicate how management of existing and potential land uses and resources would differ from current management. Three strategies were formulated to illustrate these differences. The strategies include examples of reasonable potential management actions for comparison purposes only and should not be construed as comprehensive management alternatives, as will be prepared in the resource management planning process. The objective of each strategy is to protect and enhance the outstandingly remarkable values identified in chapter 3, while allowing existing land uses and activities to continue

to the extent possible. The three alternative management strategies analyzed in this section are Current Management, Current Management Intensified, and Wild and Scenic Designation. An energy resource development strategy was not included here because new hydroelectric facilities are inconsistent with existing management plans and would be inconsistent with the Wild and Scenic Rivers Act if the river were designated. In addition, several hydroelectric development scenarios are analyzed in the FERC EIS for the proposed Salt Caves project. Both this study report and the FERC EIS should be read for a complete array of potential effects in the canyon.

Management Objectives Common to all Strategies

Management objectives that would occur under all strategies are described here and will not be repeated in the description of each alternative management strategy. The BLM would continue as the principal administrative agency, in cooperation with appropriate State and local agencies. The BLM's Klamath Falls (Oregon) and Redding (California) Resource Area offices are in the process of developing resource management plans and associated environmental impact statements (RMP/EIS). These draft RMP/EISs will include complete and comprehensive management alternatives, their environmental consequences, and a preliminary preferred alternative for management actions in the river corridor.

Land uses and developments within 1/4-mile of the river in segment 2 (between the J.C. Boyle Powerhouse and the Oregon-California state line) would be subject to review by the Oregon State Parks and Recreation Department for their compatibility with the State Scenic Waterways Act and corresponding Oregon Administrative Rules, which are designed to protect resource values in the Klamath Scenic Waterway. As provided for under section 202 (c)(9) of the Federal Land and Policy Management Act of 1976, land uses and developments on BLM-administered land would be compatible with State Scenic Waterway guidelines to the extent that they would be consistent with Federal laws, regulations, and policies governing the administration of the public lands.

A State Scenic Waterway management plan would be developed to establish the intensity of protection or development allowed according to the State classification of the river segment. Classifications for State Scenic Waterways are natural, scenic, recreational, natural scenic view, or accessible natural river. Primary emphasis is given to protecting the aesthetic, scenic, fish and wildlife, scientific, and recreation features. Table 5-3 lists restrictions on land uses and

Table 5-3. State Restrictions on Land Uses and Activities in the Klamath Scenic Waterway

LAND USE OR ACTIVITY	STATE AGENCY
No dam, reservoir, or other water impoundment facility shall be constructed within scenic waterways	Water Resources Commission
No water diversion facility shall be constructed or used except by right previously established or as permitted	Water Resources Commission
Filling of the beds or removal of material from or other alterations of the beds or banks of Scenic Waterways shall be prohibited, except as permitted	Division of State Lands
No roads, railroads, or utilities shall be constructed, except as permitted	State Parks Commission
Forest crops shall be harvested to maintain natural beauty of scenic waterway	State Parks Commission
Private landowners shall avoid polluting waters	Department of Environmental Quality
Surface disturbance from prospecting or mining shall not occur, except with approval	State Parks
No new structures or building shall be erected or placed, except with approval	State Parks
Limits on hunting, fishing, trapping by species, sex, size, season, or method	Department of Fish and Wildlife
Removal, disturbance, or modification of historic resources	State Historic Preservation Officer
Placer mining is prohibited	Water Resources Commission

activities under the State Scenic Waterways Act. More specific requirements are described in Oregon Administrative Rules (OAR 736-40-005 to 736-40-080).

Presently the BLM has no specific plan for land acquisition in segment 2. Acquisitions in segment 3 are being analyzed in alternatives for the Redding RMP/EIS. Under any of the management strategies,

land could be acquired from *willing* sellers or through exchange, donation, or jurisdictional transfer.

A general description of each management strategy follows. Table 5-4 arrays the three strategies and provides examples of possible management actions that could occur under each strategy. This table contains examples for comparison only, and is not meant to be all-inclusive.

Table 5-4. Alternative Management Strategies for Wild and Scenic Values

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
LAND OWNERSHIP/ MANAGEMENT	Land owned by BLM, USFS, State of Oregon, and private landowners; management would continue under existing policies, regulations, and laws; BLM would manage land acquired from willing sellers or through exchange, donation, or jurisdictional transfer; FERC would review licenses for J.C. Boyle and Copco hydroelectric projects in 2006, resulting in possible easement acquisition from PP&L.	Same as Current Management, plus BLM would seek to develop cooperative agreement with private landowners; area could be designated as an Area of Environmental Concern.	Same as Current Management Intensified, plus BLM would manage conservation, scenic, and/or other easements; State and local agencies could have increased management responsibility.
LAND USES- PUBLIC	Land uses and developments would continue or increase subject to existing laws, regulations, and land use plans.	Same as Current Management.	Same as Current Management, plus existing land uses could be restricted from increasing in intensity or amount; new land uses and developments would be prohibited if they would negatively impact outstandingly remarkable values.
Timber	Timber harvest would be allowed.	Same as Current Management.	Same as Current Management.
Agriculture/ Grazing	Grazing and agricultural activities would continue.	Same as Current Management, with emphasis on improving riparian habitat.	Same as Current Management Intensified.
Hydroelectric Energy (Existing)	Existing hydroelectric facilities, power withdrawals, and rights-of-way would be maintained; J.C. Boyle and Copco projects would be reviewed for relicensing in 2006.	Same as Current Management.	Same as Current Management.

Table 5-4. Alternative Management Strategies for Wild and Scenic Values (continued)

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
LAND USE-PUBLIC (continued)			
Hydroelectric Energy (New)	New hydroelectric facilities would have to be consistent with existing BLM land use plans; new dams, reservoirs, or other water impoundment facilities in segment 2 would be inconsistent with the State Scenic Waterways Act.	Same as Current Management.	Same as Current Management, but new hydroelectric projects would be restricted under section 7(a) of the Wild and Scenic Rivers Act.
Minerals	Placer mining on waters within segment 2 and surface disturbance from prospecting or mining within 1/4-mile of each river bank in segment 2 would be inconsistent with the State Scenic Waterways Act; mining would not be allowed in segment 3 during the period of study for eligibility and suitability.	Same as Current Management.	Same as Current Management, except mining could be allowed in segment 3 depending on provisions in river management plan.
LAND USES-PRIVATE			
Timber, Grazing, Minerals	Land uses would continue subject to existing State and local laws, restrictions, and land use plans.	Same as Current Management.	Same as Current Management, plus existing land uses and activities would not be directly affected by designation.
OUTSTANDINGLY REMARKABLE RESOURCE VALUES			
	Administrative designations to protect resource values could be enhanced or diminished by an amendment to BLM's land use plan; long-term protection of resource values on private land within 1/4-mile of the river would continue in segment 2 under the State Scenic Waterways Act.	Same as Current Management, but administrative designations under this alternative could be slightly more protective; protection of resources on private land could be achieved by developing cooperative agreements with landowners.	Long-term protection and enhancement of outstandingly remarkable values would be ensured under the Wild and Scenic Rivers Act.

Table 5-4. Alternative Management Strategies for Wild and Scenic Values (continued)

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
Recreation	Management would continue under existing plans for semi-primitive motorized opportunities in segment 2 and roaded natural opportunities in segment 3; minimal management presence would continue; no interpretive facilities exist.	Same as Current Management, plus BLM could increase presence; BLM activity plan could be written to include improvements in access and interpretive facilities.	Same as Current Management, plus opportunities to enhance recreation activities could occur based on actions and strategies in the management plan.
Scenic Resources	River corridor would continue to be managed under Visual Resource Management Class II guidelines.	Same as Current Management.	Same as Current Management, plus Wild and Scenic Rivers Act could place limitations on activities that would degrade scenic resources.
Fish and Wildlife	Management of fish and wildlife habitat would continue under existing plans.	Same as Current Management, plus habitat management plan would be developed as part of ACEC designation.	Long-term protection of fish and wildlife habitat would be assured under the Wild and Scenic Rivers Act; potential conflicts between wildlife and visitors would be addressed in the management plan.
Threatened, Endangered, Sensitive Species	Existing monitoring and protection of known T&E species would continue.	Level of monitoring of T&E species and their habitats would increase, new management goals could be developed as necessary.	Same as Current Management Intensified.
Cultural Resources	Existing monitoring and protection of prehistoric and historic values on public land would continue.	Same as Current Management, plus prehistoric sites would be nominated as an Archaeological District to the National Register of Historic Places.	Same as Current Management Intensified.
Native American Traditional Use	Access to and use of religious and cultural sites would continue under the American Indian Religious Freedom Act.	Same as Current Management.	Long-term protection of outstandingly remarkable values that contribute to spiritual and cultural activities would be assured under the Wild and Scenic Rivers Act.

Table 5-4. Alternative Management Strategies for Wild and Scenic Values (continued)

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
WATER RESOURCES			
Klamath River Basin Compact	The Klamath River Basin Compact would continue to guide distribution of water in the Klamath River Basin in conjunction with existing State law.	Same as Current Management.	Same as Current Management.
Existing Water Rights and Diversions	The States of Oregon and California would continue to administer water rights under the provisions of State law and the Klamath River Basin Compact; existing diversions would be unaffected.	Same as Current Management.	Same as Current Management, plus valid rights could be established pursuant to section 13(c) of the Wild and Scenic Rivers Act consistent with the Klamath River Basin Compact.
Future Water Rights and Diversions	Any new water rights applications would be subject to existing State law and the Klamath River Basin Compact.	Same as Current Management.	Same as Current Management, plus new diversions would be subject to consideration of effects on designated segments of the upper Klamath River.
Water Quality	BLM would continue to assess resource activities that could affect water quality.	Same as Current Management.	Same as Current Management.

Strategy 1 - Current Management

Strategy 1 would be a continuation of Federal, State, and local management actions, under authorities described in table 5-1. Various administrative classifications exist to protect the resources in the study area (table 5-2). Because the BLM classifications are administrative, they could be enhanced or diminished through the BLM land use planning process; therefore, long-term protection of outstandingly remarkable values on public lands would not be guaranteed. Under strategy 1, most land uses and developments on public land could continue or increase, subject to existing Federal laws, restrictions, and land use plans. Most land uses and developments on private land could continue or increase, subject to existing State and local laws, restrictions, and land use plans.

Strategy 2 - Current Management Intensified

Strategy 2 would be similar to strategy 1, but additional administrative designations and actions, to be determined in a BLM resource management plan, could be implemented to enhance resource protection beyond that of Current Management. BLM designations could be enhanced or diminished through an amendment to land use plans. Such an amendment would require public involvement. As with strategy 1, long-term protection of the outstandingly remarkable values would not be assured. Under strategy 2, most land uses and developments on public land could continue, subject to existing Federal laws, restrictions, and land use plans. BLM would seek to improve protection of resources on private land by developing cooperative agreements with landowners. Most land uses and development on private land could continue, subject to existing State and local laws, restrictions, and land use plans.

Under management strategy 2, the canyon could be designated an Area of Critical Environmental Concern (ACEC) in segment 2 through the BLM's planning process. ACEC designations highlight areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural, and scenic values; fish or wildlife resources; or other natural systems or processes. An ACEC designation indicates that the BLM recognizes an area has significant values and has established special management measures to protect those values.

In 1986, the Oregon Chapter of the Sierra Club nominated the Klamath Canyon from rim to rim and from the J.C. Boyle Powerhouse to the Oregon-California border for the BLM's consideration for

ACEC designation. Potential ACEC status and appropriate interim management, if any, will be determined by the Lakeview District Manager in the land use planning process.

Strategy 3 - Wild and Scenic Designation

Under strategy 3, eligible and suitable segments of the upper Klamath River would be added to the NWSRS as a result of Congressional designation. Long-term protection and enhancement of outstandingly remarkable resources would be realized. A wide range of management opportunities, to be defined during formulation of a river management plan, would be available for management, protection, and enhancement of outstanding and significant resource values. General guidelines for management of rivers designated as scenic or recreational, as well as for State Scenic Waterways, are described in appendix H.

Under section 6(b) of the Wild and Scenic Rivers Act, acquisition of fee title by condemnation would be prohibited because more than 50 percent of the river area is owned in fee title by the United States. However, the use of condemnation would not be precluded when necessary to clear title or to acquire scenic or other easements as are reasonably necessary to protect outstandingly remarkable values that were threatened by a potential land use, activity, or development, or to provide public access to the river.

If 50 per centum or more of the entire acreage outside of the ordinary high water mark on both sides of the river within a federally administered wild, scenic or recreational river area is owned in fee title by the United States, by the State or States within which it lies, or by political subdivisions of those States, neither Secretary shall acquire fee title to any lands by condemnation under authority of this Act. Nothing contained in this section, however, shall preclude the use of condemnation when necessary to clear title or to acquire scenic easements or other such easements as are reasonably necessary to give the public access to the river and to permit its members to traverse the length of the area or of selected segments thereof.

Public access is adequate along the upper Klamath River; therefore, it would not be used to condemn in either segment 2 or 3. Given the current pattern of ownership in segment 2, there would be no need for Federal acquisition of private property. It is possible that the BLM would seek either to develop coopera-

tive agreements or to acquire scenic, conservation, or other easements, or fee title land through exchange or purchase from *willing* parties to facilitate management of the area and enhance resource protection on private property. These potential acquisitions would be considered further in the management plan after consultation with private landowners. Land exchanges or jurisdictional transfer of U.S. Forest Service (USFS) and/or State lands would be pursued more actively than under the other strategies.

Most land uses and activities on public lands would continue at their current intensity, but could be prohibited from increasing in either intensity or amount. New land uses and developments on public lands would be prohibited if they would have a negative impact on any outstandingly remarkable value. Most land uses and activities on private lands would continue, subject to existing State and local laws, restrictions, and land use plans. Federal designation would not directly affect existing land uses and activities on private lands.

Summary Comparison of Alternative Management Strategies

This section provides a comparison of the ability of the agency to manage the designated river, restrictions on land uses, and the protection of outstandingly remarkable values for the three strategies as described previously. If the agency could manage the river as a designated river with few restrictions on land uses while ensuring protection of the river's resource values, then the river is suitable for designation under the NWSRS.

Ability of the Agency to Manage the Designated River. The cost to manage the study area should increase progressively from strategy 1 to 3 as proposed; however, the study area could be managed under designation at or near the present management level for little or no additional cost. Increased management costs could include project money, time, and personnel; possible easement acquisition; and exchange or purchase of fee title land from willing parties. Specific figures would be highly variable depending on the actions under each strategy. The State's role could be greater in segment 2 under strategies 1 and 2 through the State river management plan required under the State Scenic Waterways Act. State and local agencies could have a more active role in management decisions and a greater fiscal responsibility under strategy 3 through participation in the BLM river management plan required under the Federal Wild and Scenic Rivers Act.

The geographic extent and level of BLM's management in the canyon could increase from strategy 1 to 3 as proposed. Cooperative agreements; scenic, conservation, and other easements; land acquisition; and jurisdictional transfers or land exchanges could increase the geographic extent of BLM-administered land. Administrative designations (such as potential Area of Critical Environmental Concern classification under strategy 2), legislation (such as Congressional designation under strategy 3), and additional personnel (such as a full- or part-time river ranger under any of the strategies) should increase the level of BLM's management of the upper Klamath River.

A resource management plan and corresponding environmental impact statement would be completed, and would include public participation, under each of the three strategies. A river management plan, relying heavily on public and State and local agency participation and cooperation, would be developed under strategies 2 and 3. Under strategy 3, the river management plan would be developed under authority of the Wild and Scenic Rivers Act of 1968 and would include intensive public and agency participation.

Restrictions on Land Uses. Restrictions on land uses, activities, and major developments on BLM-administered land generally increase progressively from strategy 1 to 3. These activities and developments would be most restricted under strategy 3. Under strategies 1 and 2, certain developments, such as new hydroelectric projects, would be inconsistent with current BLM land use plans and would require a land use plan amendment and/or site-specific environmental analysis before they could be allowed by the BLM. Proposed new land uses, activities, and developments within 1/4-mile of the river in segment 2 should be reviewed by the Oregon State Parks and Recreation Department before they take place. As provided for under section 202 (c)(9) of the Federal Land and Policy Management Act of 1976, land uses and developments on BLM-administered land would be compatible with State Scenic Waterway guidelines to the extent that they would be consistent with Federal laws, regulations, and policies governing the administration of the public lands.

Protection of Outstandingly Remarkable Values. Under strategies 1 and 2, the outstandingly remarkable and significant values would be adequately protected in the short term under existing plans and designations. However, this protection could be enhanced or diminished through the BLM land use planning process. Protection and/or enhancement of these identified values would not be guaranteed under either strategy 1 or 2, except as provided under

the State Scenic Waterways Act. Congressional designation under strategy 3 however, would provide for long-term protection of the river and its immediate environment. This protection would be specified in a comprehensive management plan, as required by the Wild and Scenic Rivers Act. Outstandingly remarkable and significant values on private land would be provided the highest level of protection through cooperative agreements, exchanges, and acquisitions under strategy 3.

Summary. The BLM would be able to manage the river corridor under any of the three alternative management strategies with the geographic extent and level of management greatest under strategy 3. Public and agency participation would be most active under strategy 3. Existing land uses and activities would continue under any alternative management strategy with new land uses, activities, and developments least restricted under strategy 1. Long-term protection of the outstandingly remarkable values would be assured only under strategy 3. The BLM could manage the upper Klamath River as a designated river with few restrictions on land uses while ensuring long-term protection of the river's resource values; therefore, the management actions under strategy 3 correspond with the suitability of the river for inclusion in the NWSRS.

Reasonably foreseeable potential effects from the three strategies are discussed in the following sections of this chapter and constitute the final factor in determining the suitability of the upper Klamath River for inclusion in the NWSRS.

Reasonably Foreseeable Potential Effects Due to Designation

This section describes some of the potential effects that could occur under each management strategy. Potential effects from strategies 1 and 2 are briefly summarized in the following paragraphs. Potential effects from strategy 3, designation of the river, are described in greater detail than are those from strategies 1 and 2 to address the question of suitability determination. Table 5-5 displays a summary of the reasonably foreseeable potential effects from strategies 1, 2, and 3. If there are few potential effects of minor intensity resulting from designation, the upper Klamath River would be more suitable than if there were several potential effects that were more extreme.

Certain values could be affected if the upper Klamath River is not included in the National System, as under strategies 1 and 2. If the river is not designated and if the proposed Salt Caves or any other hydroelectric project were licensed by the FERC, authorized by other applicable agencies, and built, certain resource values would be foreclosed or diminished and some economic effects realized from its construction and operation. Potential impacts from construction of the proposed Salt Caves hydroelectric project are discussed in the FERC EIS.

Certain reasonably foreseeable potential uses of the land and related waters could be enhanced, foreclosed, or curtailed if the area were included in the NWSRS, as under strategy 3. The reasonably foreseeable potential effects of strategy 3 compared to the continuation of current management are expanded in this section. Comparison of the potential effects of designation (discussed in this document) with the potential effects of the proposed Salt Caves hydroelectric project (discussed in the FERC EIS) will be valuable in making an informed decision on whether the upper Klamath River should be included in the NWSRS.

Potential effects of designation on land ownership and management are discussed first, followed by effects on public and private land uses, outstandingly remarkable values, and water issues. A summary of the potential effects from the three management strategies are shown in table 5-5.

Land Ownership and Management

Effect on Private Lands. Land use controls on private lands are a matter of local zoning. Although the Wild and Scenic Rivers Act of 1968 includes provisions encouraging protection of river values through State and Federal land use planning, these provisions are not binding on local governments. State-mandated land use planning includes 19 Statewide Planning Goals and one of these does relate to "potential and approved federal wild and scenic waterways and state scenic waterways." Under Oregon's statewide planning program, county planning and zoning must be consistent with State and Federal river designations and programs to protect natural and scenic resources. If special use designations are applied by State or Federal agencies, county zoning would be amended to conform with the new designations.

The Federal government is responsible for assuring that designated rivers are managed to meet the intent

Table 5-5. Summary of Reasonably Foreseeable Potential Effects of Management Strategies

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
LAND OWNERSHIP/ MANAGEMENT	Developments would be allowed subject to existing local, State, and Federal laws, policies, and guidelines; management costs would not increase.	Developments would be allowed with slightly increased restrictions; management costs could increase slightly.	Certain developments would not be allowed if in conflict with the Wild and Scenic Rivers Act; consolidation of land ownership to BLM would enable more efficient management of the designated river; BLM's costs could be higher than under Current Management Intensified; State and local agencies could have increased fiscal responsibility.
LAND USES- PUBLIC	Land uses would continue at existing levels.	Same as Current Management.	Land uses present at time of designation would generally not be affected; however, substantial increases or changes may be prohibited.
Timber	Timber would remain in BLM timber base.	Same as Current Management.	Timber harvest would not be significantly affected; timber harvest would be allowed if no adverse effect on river environment; restriction on fuel wood cutting may be imposed.
Agriculture/ Grazing	No change in grazing and agricultural opportunities would occur.	Same as Current Management, plus greater emphasis would be placed on riparian habitat.	Same as Current Management Intensified; generally no effect on activities that were present at the time of designation, although substantial increase or change in use may be prohibited.
Hydroelectric Energy (Existing)	Hydroelectric energy would continue to be generated. It is impossible to predict which benefits or drawbacks would occur if the J.C. Boyle and Copco projects are relicensed in 2006.	Same as Current Management.	Same as Current Management.

Table 5-5. Summary of Reasonably Foreseeable Potential Effects of Management Strategies (continued)

	1 (Current Management)	2 (Current Management intensified)	3 (Wild and Scenic Designation)
LAND USE-PUBLIC (continued)			
Hydroelectric Energy (New)	New hydroelectric facilities would be required to be consistent with existing land use plans; new dams, reservoirs, or other water impoundment facilities in segment 2 would be inconsistent with the State Scenic Waterways Act.	Same as Current Management.	Same as Current Management, plus new hydroelectric facilities would be restricted under section 7(a) of the Wild and Scenic Rivers Act.
Minerals	Placer mining in the river in segment 2 would continue to be inconsistent with the State Scenic Waterways Act; no other impacts would occur to mineral resources based on past and anticipated future activity.	Same as Current Management.	Same as Current Management.
LAND USES-PRIVATE Timber, Grazing, Agriculture, Minerals			
	Federally-imposed changes would occur in the opportunities for timber harvest, grazing, agricultural practices, or mineral extraction on private land; timber harvest activities within 1/4-mile of the river in segment 2 would continue to be regulated under Oregon Administrative Rules for State Scenic Waterways; placer mining in the river in segment 2 would continue to be inconsistent with the State Scenic Waterways Act.	Same as Current Management.	Same as Current Management.

Table 5-5. Summary of Reasonably Foreseeable Potential Effects of Management Strategies (continued)

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
OUTSTAND- INGLY REMARKABLE RESOURCE VALUES	Short-term protection of resource values on public land would continue; long-term protection of resource values on private land within 1/4-mile of the river in segment 2 would continue under the State Scenic Waterways Act.	Same as Current Management.	Long-term protection of resource values on public land would be ensured under the Wild and Scenic Rivers Act; long-term protection of resource values on private land within 1/4-mile of the river in segment 2 would continue under the State Scenic Waterways Act.
Recreation	Whitewater rafting experiences would continue to be enhanced from water releases for power generation from the J.C. Boyle Powerhouse. Annual visitor use days associated with whitewater boating would continue to slightly increase, diminishing recreation experience and opportunities for solitude; degradation of recreation sites could be accelerated.	Same as Current Management, plus recreation opportunities could be enhanced from actions in BLM activity plan.	Same as Current Management; no significant effect but would ensure the continuation of a variety of recreational opportunities.
Scenic Resources	Scenic values could be slightly diminished from increased visitor use.	Same as Current Management.	Scenic resources would be assured long-term protection under restrictions in the Wild and Scenic Rivers Act.
Fish and Wildlife	No impact would occur to fish or wildlife habitat (including T&E species).	Implementation of a habitat management plan could enhance some types of fish and/or wildlife habitat.	Fish and wildlife habitat would be assured long-term protection under the Wild and Scenic Rivers Act; increases in visitor use could create conflicts with fish and wildlife.
Cultural Resources	Unintentional damage to cultural resources on public and private land would continue from recreation and other activities.	Protection of prehistoric resources would be enhanced as a result of placement on the National Register of Historic Places.	Same as Current Management Intensified.
Native American Traditional Uses	Native American traditional use of the canyon would continue.	Same as Current Management.	Same as Current Management, plus long-term protection of a wide range of resources important to Native American use would be assured.

Table 5-5. Summary of Reasonably Foreseeable Potential Effects of Management Strategies (continued)

	1 (Current Management)	2 (Current Management Intensified)	3 (Wild and Scenic Designation)
WATER ISSUES			
Klamath River Basin Compact	The Klamath River Basin Compact would continue to guide distribution of water in the Klamath River Basin.	Same as Current Management.	Same as Current Management.
Existing Water Rights and Diversions	Existing rights would continue to be exercised under applicable laws and regulations; existing diversions would be unaffected.	Same as Current Management.	Same as Current Management, plus any taking of valid existing rights would require the United States to provide owner with compensation pursuant to section 13(b) of the Wild and Scenic Rivers Act.
Future Water Rights and Diversions	New rights allowed to the extent that unappropriated waters are available, pursuant to existing laws, including Klamath River Basin Compact.	Same as Current Management.	Same as Current Management with consideration of any valid right established pursuant to section 13(c) of the Wild and Scenic Rivers Act.
Water Quality	BLM would continue to assess resource activities that could affect water quality.	Same as Current Management.	Same as Current Management.

of the Act. In the absence of local or State river protection provisions, the Federal government could assure compliance through acquisition of private lands or interests in lands.

Section 6(b) of the Wild and Scenic Rivers Act prohibits Federal condemnation to purchase fee title lands when 50 percent or more of a designated river corridor is public lands, such as if segment 2 alone or segments 2 and 3 together of the upper Klamath River were designated. Section 6(b) does allow the use of condemnation to purchase scenic easements as a measure of last resort to remove or prevent a threat to the river or its outstandingly remarkable values.

The basic objective of Wild and Scenic River designation is to maintain the river's existing condition. If a land use or development clearly threatens the outstandingly remarkable values which resulted in the river's designation, efforts would be made to remove the threat through local zoning, State Scenic Waterways Act provisions, land exchanges, or purchases from willing sellers. (Under the Oregon State Scenic Waterways program, the State may condemn private property for fee simple acquisition only). Designation would have little or no effect on private land.

Effect on Management of Public Lands. Management of lands in the river corridor would be more consistent if the BLM managed more of the land through fee title land acquired from the USFS and/or State through exchange or jurisdictional transfer or easements acquired from willing landowners. The cost to manage the designated river could increase over that of current management; however, the designated river area could be managed at or near current management levels for little or no additional cost. Designation would enhance the management of public lands.

Land Uses

Effect on Timber Harvest. The existing Jackson-Klamath land management plan already places constraints on timber harvest on public land in the Klamath River canyon. Beyond this, timber harvest on Federal land would not be significantly affected if the upper Klamath River were designated. According to the Management Guidelines and Standards for National Wild and Scenic Rivers—Oregon/Washington (BLM 1989), summarized from the 1970 and 1982 joint Department of the Interior and Department of Agriculture guidelines published in the Federal Register, silvicultural practices, including timber harvesting, could be allowed, provided such practices

occur without substantial adverse effect on the river or its immediate environment. Cutting of dead and down materials for fuelwood would be limited. Where necessary, restrictions on use of wood for fuel may be prescribed. Management guidelines for scenic and recreational rivers, in addition to guidelines for Oregon Scenic Waterways, are shown in appendix H.

Timber harvest activities on private lands in segment 2 are regulated by the Oregon Forest Practices Act, not by the BLM; therefore, designation would have no effect on private timber harvest. In addition, timber harvest activities on private lands within 1/4-mile of the river would be regulated under Oregon Administrative Rules for Oregon Scenic Waterways (OAR 736-40-005 to 736-40-095), which requires, among other things, notification to the Oregon State Parks and Recreation Department of planned timber harvest operations. No effects on the timber industry in Klamath County would result from designation of the upper Klamath River.

Effect on Agriculture and Grazing. Generally, agricultural and grazing activities on public land that were present at the time of designation would not be affected. However, increases from current levels may be prohibited if the increase would cause a substantial adverse effect on the natural appearance of the river area. The BLM has no jurisdiction over private lands, so no effect on agriculture and grazing would occur on those lands. Little or no effect on the agricultural industry in either Klamath or Siskiyou counties would result from designation.

Effect on Existing Hydroelectric Projects. Maintenance of existing facilities, such as the J.C. Boyle Hydroelectric Project, and construction of some new structures would be permitted, provided the area remained natural in appearance; the structures harmonized with the surrounding environment; and any activity that occurred in the State Scenic Waterway (segment 2) was permitted by the Oregon Water Resources Commission.

Effect on Future Hydroelectric Projects. Section 7(a) of the Wild and Scenic Rivers Act addresses development of hydroelectric power facilities, dams, and reservoirs within designated segments. Section 7(a) states:

The Federal Power Commission shall not license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act (41 Stat. 1063), as amended (16 U.S.C. 791a et seq.) on or directly affecting any river which is designated in section 3 of

this Act as a component of the national wild and scenic rivers system or which is hereafter designated for inclusion in that system, and no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.

Continuing in section 7(a), hydroelectric projects upstream and downstream of designated segments are discussed:

Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a wild, scenic or recreational river area or on any stream tributary thereto which will not invade the area or unreasonably diminish the scenic, recreation, and fish and wildlife values present in the area on the date of designation of a river as a component of the National Wild and Scenic Rivers System.

Section 390.835 (1) of the Oregon State Scenic Waterways Act addresses future dams, reservoirs, and impoundments:

* * * No dam, or reservoir, or other water impoundment facility shall be constructed or placer mining permitted on waters within scenic waterways. No water diversion facility shall be constructed or used except by right previously established or as permitted by the Water Resources Commission, upon a finding that such diversion is necessary to uses designated in ORS 536.310 (12), and in a manner consistent with the policies set forth under ORS 390.805 to 390.925 [the State Scenic Waterways Act].

Effect on Mineral Activity. No effect on mineral activity would occur on any designated river segment. Placer mining in the river is prohibited in segment 2 under section 390.835 (1) of the State Scenic Waterways Act.

Outstandingly Remarkable Values

Effect on Recreation. Designation would have no significant effect on, but would ensure the continuation of, a variety of recreational opportunities, including whitewater rafting, kayaking, fishing, hunting, camping, sightseeing, hiking, photography,

picnicking, wildlife observation, driving for pleasure on existing roads, trapping, off-road vehicle use, and horseback riding. Visitor use in the canyon, predominantly for whitewater boating, has been increasing since 1982 when the BLM began keeping visitor use records. Visitor use could increase slightly more rapidly as a result of designation. As use increases, so would the potential for fire danger and environmental damage, including vandalism, litter, or overuse. Opportunities for solitude would decrease with increased use. Compatible recreation facilities could be built to enhance the recreational experience. Any changes expected to result from designation would be considered during preparation of the river management plan.

Effect on Scenic Resources. Designation would ensure long-term protection for the Class A scenic resources through preservation of the VRM Class II management objective to retain the existing character of the landscape. The canyon would be protected against land uses or activities on public land along the river that could impair the outstandingly remarkable scenic resources. Many land uses and activities could still occur, but not within sight of the river. Land uses and activities within 1/4-mile of the river in segment 2 would be subject to review by the Oregon State Parks and Recreation Department. Developments on private land in segment 3 that were within sight of the river could impair the scenic quality in the river corridor. This could be mitigated by acquisition of scenic easements by the BLM or the State of Oregon.

Effect on Fish and Wildlife. Inclusion of the upper Klamath River in the NWSRS would affect fish and wildlife both positively and negatively. Designation would enhance the existing laws, policies, and classifications of fish and wildlife habitat in the canyon and would ensure long-term protection of fish and wildlife values. However, if use of the area increased as a result of designation, increased fishing and hunting pressure could occur. Increased whitewater boating could have a negative effect on nesting bald eagles and prairie falcons and on a maternity colony of Townsend's big-eared bat.

Section 13(a) of the Wild and Scenic Rivers Act addresses to the jurisdiction of State fish and wildlife agencies in designated river segments:

Nothing in this Act shall affect the jurisdiction or responsibilities of the States with respect to fish and wildlife. Hunting and fishing shall be permitted on lands and waters administered as parts of the system under applicable State and Federal laws and regulations * * *. The

administering Secretary may, however, designate zones where, and establish periods when, no hunting is permitted for reasons of public safety, administration, or public use and enjoyment and shall issue appropriate regulations after consultation with the wildlife agency of the State or States affected.

Effect on Prehistoric Resources. Designation would not change prehistoric resource management goals and objectives on public lands. Prehistoric resources would continue to receive the protection and consideration mandated by Federal laws and policies. The quality of prehistoric resources on private lands could continue to be diminished unless a cooperative agreement was developed or a scenic or conservation easement was acquired by the BLM from landowners.

Effect on Historical Resources. Designation would not change historical resource management goals and objectives on public lands. Historical resources would continue to receive the protection and consideration mandated by Federal laws and policies. The quality of historical resources on private lands could continue to be diminished unless a cooperative agreement was developed or a scenic or conservation easement was acquired by the BLM from landowners.

Effect on Native American Traditional Use. Designation would have a positive effect on Native American traditional use of the canyon by providing long-term protection for the outstandingly remarkable values enjoyed by Native Americans. These values are substantial contributing factors to the Native American spiritual and cultural activities in the canyon. As visitor use increases, opportunities for solitude could decrease.

Water Issues

Effect on the Klamath River Basin Compact. Although all potentially affected parties do not agree, the BLM, based on available information, believes that there would be no significant conflicts between management of the upper Klamath River in the study area under the Wild and Scenic Rivers Act and the Klamath River Basin Compact. The BLM recognizes that designation may have some effect on future water right applications if the proposed use of the water would have an adverse effect on the outstandingly remarkable values in the designated segment. Future water appropriations, including offstream storage, could be allowed on a designated river to the extent they are consistent with State law, the Compact, and section 13 of the Wild and Scenic Rivers

Act. Because of the highly speculative nature of future applications and resulting effects, if any, no related analysis is made in this study.

The following three sources are representative of the perceived relationship between the upper Klamath River, if designated, and the Klamath River Basin Compact. Section 13(e) of the Wild and Scenic Rivers Act states:

Nothing contained in this Act shall be construed to alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by any States which contain any portion of the national wild and scenic rivers system.

Senator Hatfield, in the October 7, 1988 Senate Congressional Record (S 15242), addressed this issue specifically in regards to the situation on the upper Klamath River:

*** The Oregon attorney general concluded that section 13(e) of the Wild and Scenic Rivers Act of 1968 makes it clear that there is no necessary conflict between the compact and wild and scenic designation. As such, a conflict between the compact and any designation which Congress may make in the future could not occur.

I strongly believe in protecting interstate agreements. Congress should not attempt to overturn or override them through back-door methods. I stated many times during the hearings process that I did not intend for the compact to be overturned by a future wild and scenic river designation, and am pleased that Attorney General Frohnmayer has underscored this principle through his opinion.

The chair of the Klamath River Compact Commission stated (Kuonen, pers. comm. 1989):

Having studied the compact and the reasons for which it was formed, I can tell you that whatever Congress' legal authority may be with respect to designation of the Upper Klamath as wild and scenic, such designation can not be squared with the purposes and policies of the Compact ***

I do not see how anyone could possibly conclude that Wild and Scenic designation is in accord with this purpose. Wild and Scenic designation restricts the use of the designated area to one of the five uses set forth in the

Compact. The Compact says that the comprehensive development of all five of the uses are to be facilitated and promoted. I would sincerely hope that the study team's report can see through the narrow legal question that Attorney General Grohmayer's [sic] opinion spoke to, and understand the very basic conflict between Wild and Scenic designation and the purpose of the Compact to protect and promote mixed uses.

Effect on Existing and Future Water Rights. Designation of the upper Klamath River would have no effect on valid existing water rights. This is specifically provided for in section 13 of the Wild and Scenic Rivers Act:

(b) The jurisdiction of the States and the United States over waters of any stream included in a national wild, scenic or recreational river area shall be determined by established principles of law. Under provisions of this Act, any taking by the United States of a water right which is vested under either State or Federal law at the time such river is included in the national wild and scenic rivers system shall entitle the owner thereof of just compensation. Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(c) Designation of any stream or portion thereof as a national wild, scenic or recreational river area shall not be construed as a reservation of the waters of such streams for purposes other than those specified in this Act, or in quantities greater than necessary to accomplish these purposes.

(d) The jurisdiction of the states over waters of any stream included in a national wild, scenic or recreational river area shall be unaffected by this Act to the extent that such jurisdiction may be exercised without impairing the purposes of this Act or its administration.

Existing irrigation systems and other water developments and diversions would not be affected by designation of the eligible and suitable segments of the upper Klamath River. Any new water diversion proposed within or upstream of the designated river segment would require evaluation to determine if it would conflict with the protection and enhancement of the values that caused it to be included in the

NWSRS. Provisions in the State Scenic Waterways Act would prohibit any new water diversion proposed in segment 2 requiring a dam, reservoir, or other impoundment facility.

The specific effect of designation on future water rights applications cannot be assessed in a hypothetical setting. There are too many variables which would have to be considered in determining whether new water rights would have any impact on the designated segment of the river. These variables could include point of diversion, amount of diversion, type of use, place of use, place of storage, point of return flows, and hydrologic conditions, to name a few. Generalized statements indicating that designation would preclude future agricultural development or offstream storage are completely unfounded. Some water rights developments could even be beneficial to flows in the designated segments. For example, releases of water from offstream storage upstream of the designated segment could enhance flows during periods of low water. Finally, acquisition of any new water rights after designation would still be governed by existing laws, which include State law and the Klamath River Basin Compact.

Effect on Water Quality. The following discussion is based on a letter from Oregon Department of Environmental Quality's Director, Fred Hansen, to Senator Mark Hatfield during the Congressional hearings on the Omnibus Oregon Wild and Scenic Rivers Act (Congressional Record H 10117 and S 15245).

Designation of a wild and scenic river segment, by itself, would not automatically result in additional restrictions on activities upstream from that segment. Under existing Oregon laws and rules, such activities would have to be conducted in a manner that would assure best management practices were applied, that existing water quality standards would not be violated, and that beneficial uses of the waterway downstream from the activity would not be adversely affected by changes in water quality.

Monitoring and evaluation of best management practices is ongoing in Oregon. If current best management practices are determined to be insufficient to protect the beneficial uses and values in the designated segment, improved or additional best management practices could be required by the Oregon Department of Environmental Quality, or it might be necessary to either impose stricter controls or limit specific activities in portions of the upstream area.

The Wild and Scenic Rivers Act provides no specific guidance on water quality for scenic or recreational rivers; however, new or expanding projects or activities that would potentially affect water quality within, upstream, and downstream of a designated river segment would be constrained by Federal and State water quality laws. Management standards for scenic rivers (BLM 1989) state that water quality in designated river segments would be maintained or improved to meet Federal criteria or Federally-approved State standards.

Summary

Land ownership and management would generally be unaffected by designation. Existing land uses and activities on public and private lands would remain at existing levels after designation. New land uses, activities, and developments could be affected by designation if they would cause an adverse impact on either the river or its outstandingly remarkable values. New hydroelectric facilities would be restricted under section 7(a) of the Wild and Scenic Rivers Act. Long-term protection of the outstandingly remarkable values would be assured by inclusion of the upper Klamath River in the NWSRS through provisions in the Wild and Scenic Rivers Act. If the river were designated, visitor use could increase, causing conflicts with some of the resource values. These potential conflicts would be addressed and possibly mitigated through the river management plan. Valid existing water rights would be unaffected by designation, as specified in the Act. Future water rights would still be governed by existing laws, including State law and the Compact. Water quality would be maintained or improved, as specified in the 1989 BLM management standards for designated rivers.

Inclusion of the upper Klamath River in the NWSRS would result in few potential effects of minor intensity to *existing* land uses, activities, and resources; possible restrictions or preclusion of certain *future* land uses, developments, or activities; and assurance of long-term protection for outstandingly remarkable values. A comparison of a) the minor effects on existing land uses in conjunction with protection of the river values and b) the potential effects on future land uses, activities, and developments, illustrates that the upper Klamath River is suitable for inclusion in the National Wild and Scenic Rivers System.

Conclusion

Through this study it has been determined that segments 2 and 3 of the upper Klamath River (river mile 220.3 to 204) are eligible and suitable for inclusion in the National Wild and Scenic Rivers System with a scenic classification. Compatibility of the existing situation with Federal designation, analysis of alternative management strategies, and reasonably foreseeable potential effects of designation on the management and protection of the land and resources in the Klamath River Canyon were used to determine the suitability of the river for inclusion in the National system, under guidance provided in the Wild and Scenic Rivers Act.

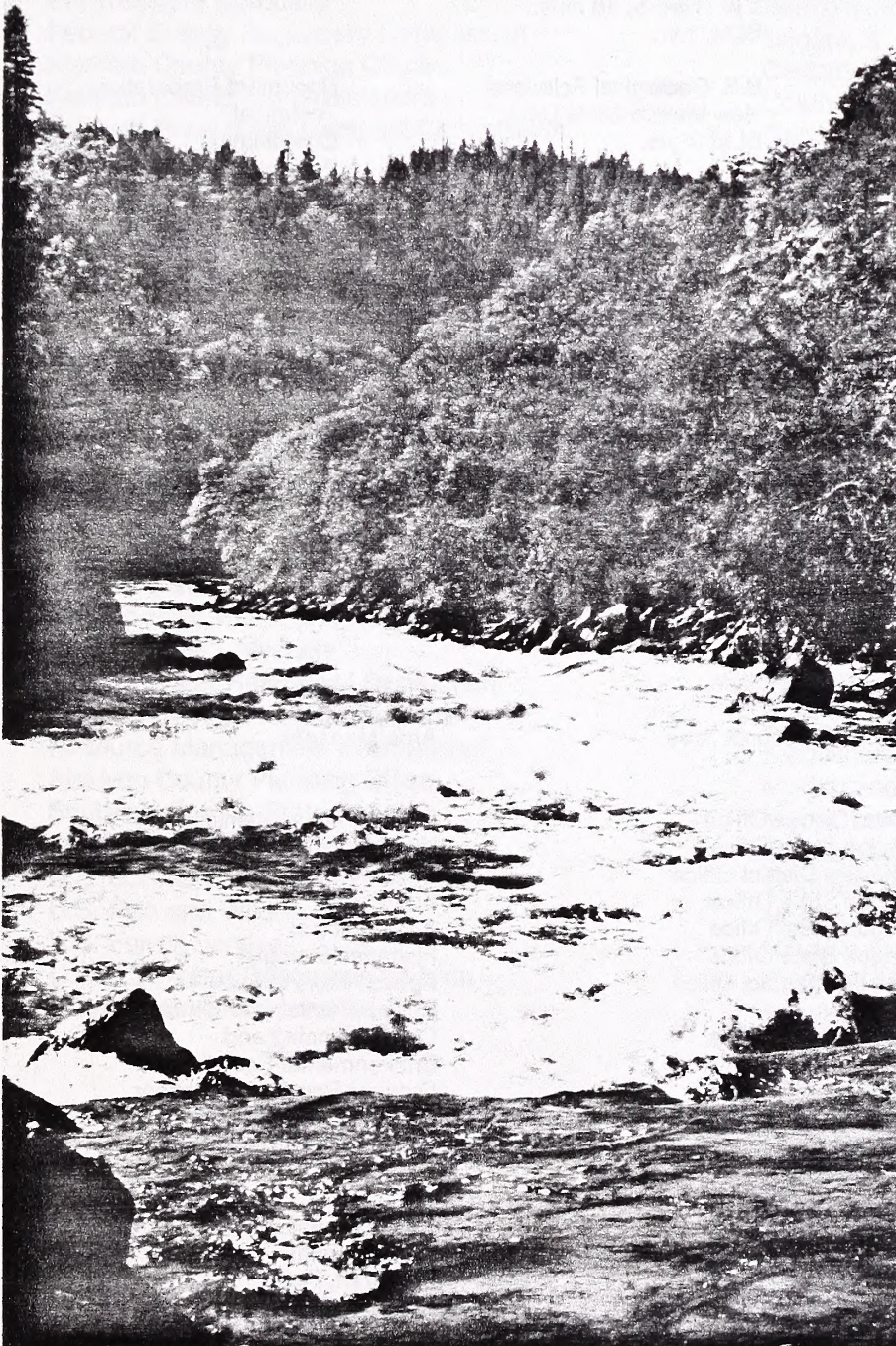
The large amount of Federal ownership in the canyon, resource protection from the State Scenic Waterways designation in segment 2, and presence of many diverse outstandingly remarkable values that equal or surpass similar resource values on other designated rivers (recreational, wildlife, fish, prehistoric, historic, and scenic values, and the unique Native American traditional use of the canyon) enhance the suitability of the upper Klamath River as an addition to the NWSRS. The other aspects of the existing situation are compatible with the river's designation.

The management strategies were analyzed in terms of the river corridor's manageability; continuation of existing land uses and activities; restrictions on new land uses, developments, and activities; and the degree of protection of outstandingly remarkable values. If the upper Klamath River were added to the NWSRS, the BLM would continue to manage the land and resources at or above current levels; existing land uses and activities would continue at current levels; new land uses, development, and activities could occur with possible limitations as described in appendix H; and the outstandingly remarkable values would be afforded the greatest degree of protection, as provided under the Wild and Scenic Rivers Act.

The reasonably foreseeable potential effects on the management and protection of the land and resource values would be minimal and of minor intensity. The greatest positive effect would be the long-term protection of outstandingly remarkable resources in the upper Klamath River's ecosystem. The greatest negative effect would be the restrictions on new land uses, developments, and activities—especially those that would negatively impact the outstandingly remarkable resource values in the canyon.

Therefore, it is concluded that in its existing condition, the upper Klamath River is suitable for designation and would make a worthy addition to the National Wild and Scenic Rivers System.

Chapter 6 – Preparers, Consultation, Glossary, and References



Caldera Rapid provides class IV and V whitewater.

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Ron Hicks	Wildlife Biologist	B.S. Wildlife Management, Humboldt State Univ.; USFS, 8 mos.; NPS, 8 mos.; USFWS, 18 mos.; Private, 1 yr.; NMFS, 18 mos.; BLM, 1 yr.	Fish, Wildlife, Vegetation, Water, Range
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Alison Poteet	Editorial Assistant	BLM, 5 yrs.	Clerical Assistance, Proofreading Assistance
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Al Wright	Ukiah District Office	District Manager
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Vicky Modrell	Oregon State Office	Typeset Draft
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Agencies and Organizations Contacted or Consulted

The River Study Team contacted, was contacted by, or consulted with the following agencies and organizations during the development of the Wild and Scenic River Study:

Beak Consultants Incorporated
California Department of Fish and Game
California Department of Water Resources
City of Klamath Falls, Oregon
Envirosphere Company
Federal Energy Regulatory Commission
Klamath County Planning Office
Klamath County Commissioners
Klamath River Basin Compact Commission
Klamath Tribe
Lakeview District Multiple Use Advisory Council
Land and Water Associates
National Park Service
Northwest Power Planning Council
Oregon Congressionals
Oregon Department of Agriculture
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Eagle Foundation
Oregon Natural Heritage Foundation
Oregon Rivers Council
Oregon State Historic Preservation Office
Oregon State Museum of Natural History
Oregon State Parks and Recreation Division
Oregon State University
Oregon Water Resources Department
Pacific Power and Light Company
Resource Management International
Siskiyou County Planning Office
Southern Oregon State College
Southern Pacific Land Company
U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S.G.S. Water Resources Division
Weyerhaeuser Corporation

Businesses, organizations, and agencies to whom copies of the Draft Eligibility and Suitability Report for the upper Klamath Wild and Scenic River Study were sent

Businesses

A.B.L.E. Rafting
Adventure Connection
Adventures Whitewater
A.R.T.A.
All Outdoors Adventure Trips
American River Recreation
Beach's Jeweler's, Inc.
Bogatay's
Century 21
Columbia Plywood Corporation
Denman and Cooney, Attorneys at Law
Diment, Billings, and Walker, Attorneys at Law
Duncan, Weinberg, Miller, and Penbroke, Attorneys at Law
Eagle Sun, Inc.
Gaylord, Thomas, and Eyerman, P.C., Attorneys at Law
Great Out of Doors Rafting
Gregory Timber Corporation
Harmony Around the World
Headwater Adventures
Interagency Archaeological Services
J.W. Kerns Company
Jeld-Wen, Inc.
Jensen and Associates
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Ken Warren Outdoors, Inc.
Klamath Consulting Service
Kingfishers Float Trips
Merten and Yugler, Attorneys at Law
Modoc Lumber Company
Morgan, Miller, and Blair, Attorneys at Law
Mountain Resort
Noah's World of Water
Novak's Auto Parts
Oregon River Experiences
Pacific Power and Light Company
Pape Bros., Inc.
Resource Management International
Rookstool and Alter, CPA
Scott-Free River Expeditions
Shotshell Ballistics Research
Sierra Whitewater Expeditions

Silver Cloud Farm
 Smith's River Adventures
 Southern Pacific Land Company
 Stoel, Rivers, Boley, Fraser, and Wysel, Attorneys
 at Law
 Sturdi-Craft, Inc.
 Thomas Lumber Company
 Tributary Whitewater Tours
 Turtle River Rafting Company
 Weyerhaeuser Corporation
 White Water Voyages
 Whitewater Connection
 Whitewater Excitement, Inc.
 Whitewater Rapid Transit
 Wild Water Adventures
 Wild Waters West Limited
 Wilderness Adventures

Organizations

American Rivers, Inc.
 Ashland Chamber of Commerce
 Association of Oregon Archaeologists
 Audubon Society of Klamath Falls
 Audubon Society of Portland
 California Trout, Inc.
 Ducks Unlimited/Shasta International
 Four Runners Four Wheel Drive Club
 Friends for Development of Renewable Resources
 Friends of the Earth
 Friends of the River
 Kiwanis, Klamath Falls
 Klamath Bassmasters
 Klamath Bow Hunters
 Klamath County Chamber of Commerce
 Klamath County Historical Society
 Klamath Country Flycasters
 Klamath River Guides and Outfitters
 Northwest Rafters' Association
 Nature Society
 Oregon Division, Izaak Walton League
 Oregon Guides and Packers, Inc.
 Oregon Hunters Association
 Oregon Natural Desert Association
 Oregon Natural Resources Council
 Oregon Rivers Council
 Oregon Wildlife Federation
 Pacific Northwest Four Wheel Drive
 Save Our Klamath Jobs
 Save Our Klamath River
 Sierra Club
 Sierra Club Legal Defense Fund, Inc.
 Southern Oregon Association of Kayakers
 Wilderness Society
 Yreka Associated Chamber of Commerce

Cities and Counties

City of Dorris, California

City of Haines, Oregon
 City of Klamath Falls, Oregon
 Coos-Curry Council of Governments
 Deschutes County Board of Commissioners
 Klamath County
 County Judge
 Planning Department
 Public Works Department
 Solid Waste Management
 Siskiyou County
 Board of Supervisors
 Department of Public Works
 Planning Department
 Rural Enterprise Commission

State Agencies

State of California
 Assistant Attorney General's Office
 Department of Boating and Waterways
 Department of Conservation
 Department of Fish and Game
 Department of Food and Agriculture
 Department of Forestry and Fire Protection
 Department of Parks and Recreation
 Department of Transportation
 Energy Commission
 Resources Agency of California
 State Lands Commission
 State Clearinghouse
 Water Resources Control Board

State of Oregon

Department of Agriculture
 Department of Energy
 Department of Environmental Quality
 Department of Fish and Wildlife
 Department of Forestry, Office of State Forester
 Department of Geology and Mineral Industries
 Department of Justice
 Department of Land Conservation and Development
 Department of Transportation, Highway Division
 Department of Transportation, Parks and
 Recreation Division
 Department of Transportation, State Historic
 Preservation Office
 Economic Development Department
 Marine Board
 Public Utility Commission
 Water Resources Department

Federal Agencies

Department of Agriculture
 U.S. Forest Service
 Department of Commerce
 National Marine Fisheries Service

Department of Defense
 Army Corps of Engineers
 Department of Energy
 Bonneville Power Administration
 Department of the Interior
 Bureau of Reclamation
 Fish and Wildlife Service
 National Park Service
 Office of the Regional Solicitor
 Regional Environmental Officer
 Environmental Protection Agency
 Region 9, Water Management Division
 Federal Energy Regulatory Commission

Other

California Indian Legal Services
 Klamath River Compact Commission
 Klamath Tribe
 Oregon Legal Services, Native American Program
 Pecos River Compact Commission
 Shasta Nation
 Umatilla Agency
 Warm Springs Agency

Approximately 200 additional individuals and organizations expressed interest in the upper Klamath River study and were sent copies of the Draft River Study Report. Included in this group were members of the California and Oregon Legislatures, U.S. Congressional delegation, schools, and local and state news media.

Individuals, businesses, organizations, and agencies who submitted comments on the draft river study

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Chin, Michael	Richmond, CA	Davis, Ray & Phyllis	Beaverton, OR
Cimino, Rich	Oakland, CA	Dawdy, Ken	San Leandro, CA
Cisek, Edward L.	Boise, ID	Dawson, Laurie	Modesto, CA
Clark, Peter	Ashland, OR	Dayton, Lang M.	Redding, CA
Claypole, Bob	Klamath River, CA	Dearborn, Harold W.	Klamath Falls, OR
Cline, Craig	Salem, OR	Deas, Mike	Manhattan Beach, CA
Cloake, Harold	Klamath Falls, OR	Dehlinger, Charlie	Klamath Falls, OR
Cochrane, Susan	Sacramento, CA	Deighton, B.S.	Moraga, CA
Coe, David	Mt. Shasta, CA	Denman, Donald K.	Medford, OR
Cogur, Cathy	Klamath Falls, OR	Demarest, Richard	Mt. Shasta, CA
Colahan, Kent	Klamath Falls, OR	Devall, Bill	Trinidad, CA
Coleman, Constance R.	Portland, OR	DeVoss, Vera N.	Bandon, OR
Collier, Doug	Klamath Falls, OR	Dicker, Julia	Klamath Falls, OR
Collier, William G.	Klamath Falls, OR	Dixon, Irving	Klamath Falls, OR
Collins, Clint	El Dorado Hills, CA	Doddridge, Phil	Klamath Falls, OR
Collins, William J.	Sacramento, CA	Dodge, Kathleen	Eugene, OR
Conroy, Jim	Klamath Falls, OR	Donaca, Thomas C.	Salem, OR
Cook, Carolyn	Klamath Falls, OR	Dorsey, R. Stephen	Eugene, OR
Cook, Guy	Klamath Falls, OR	Dortch, Robert	Klamath Falls, OR
Cook, Larry D.	Klamath Falls, OR	Douglass, Mary E.	San Francisco, CA
Cook, Walter	Marysville, CA	Dow, Burton	Klamath Falls, OR
Cooper, Michael	Eugene, OR	Downing, Lavonne	Klamath Falls, OR
Copeland, Jim	Klamath Falls, OR	Draper, M.	Mt. Shasta, CA
Cornett, Tom	Columbia, CA	Dreisbach, Charles	Klamath Falls, OR
Cornwell, David R.	Danvers, MA	Dresden, Robert	Chico, CA
Cottle, Richard C.	Ashland, OR	Drew, Frank Jr.	Klamath Falls, OR
Coules, Dennis	Pinole, CA	Drew, Frank Sr.	Klamath Falls, OR
Covel, Paul F.	Oakland, CA	Dryden, Dr. Willard	Klamath Falls, OR
Cox, Susan E.	Portland, OR	DuBois, Mark	Sacramento, CA
Craigmiles, Allen	Klamath Falls, OR	Duchume, Suzanne	Greenview, CA
Cramer, Sandra H.	Albany, OR	Dugan, Kenneth	Klamath Falls, OR
Cramer, Stephen	Albany, OR	Dumas, Michael L.	Concord, CA
Crawford, John	Tulelake, CA	Dunster, Wilford A	Klamath Falls, OR
Crawford, Robert	Tulelake, CA	Duplechien, David	Mt Shasta, CA
Crawford, Ruth Mary	Tulelake, CA	Durant, Bruce	Klamath Falls, OR
Crismon, Bonnie J.	Klamath Falls, OR	Durham, Annelle	San Francisco, CA
Cross, James E.	Los Angeles, CA	Durkee, Jeff	Portland, OR
Cross, William J.	Ashland, OR	Duryee, Mary A.	Berkeley, CA
Crounse, Mike	Klamath Falls, OR	Dutcheson, E.C.	Klamath Falls, OR
Crowl, Patrick	Arcata, CA	Dyer, Ruth	Lafayette, CA
Crutchfield, Edith	Klamath Falls, OR	Eakin, Ronald	El Sobrante, CA
Cundiff, Walt	Tigard, OR	Eberlein, Alan	Klamath Falls, OR
Cunha, George	Klamath Falls, OR	Eberlein, Neal	Klamath Falls, OR
Cunningham, Marlin	Klamath Falls, OR	Edgar, Idella	Klamath Falls, OR
Currin, Mrs. Hugh B.	Klamath Falls, OR	Edgar, Woodrow	Klamath Falls, OR

Edison, Lydia	Elk, CA	Goossen, Julie	Klamath Falls, OR
Edwards, Robert	Klamath Falls, OR	Gourley, Don	Klamath Falls, OR
Ehrmann, Joseph F.	Larkspur, CA	Graham, Dr. & Mrs. John L.	Hillsborough, CA
Eisenbrey, N.H.	Weed, CA	Grant, Hallidie	San Francisco, CA
Elander, Eleanor	Sacramento, CA	Grant, Paul W.	Davis, CA
Eldridge, Janet	Penn Valley, CA	Green, Aggee	Klamath Falls, OR
Elliott, Ron M.	Oakdale, CA	Green, Louise	Lake Oswego, OR
Ely, Richard W.	Oakland, CA	Greene, Hal D.	Klamath Falls, OR
Elzner, Jean	Klamath Falls, OR	Greer, Doris	Klamath Falls, OR
Emmett, Craig	Klamath Falls, OR	Griest, Ken	South Lake Tahoe, CA
Endres, Charles	Redding, CA	Griggs, Joe H.	Cottage Grove, OR
Erickson, Jane	Monroe, WA	Griggs, Lloyd	Cottage Grove, OR
Erlandson, G.D.	Klamath Falls, OR	Grow, Richard	Klamath Falls, OR
Ernst, Hilary	Stockton, CA	Guenther, Ron	Fort Bragg, CA
Ervin, Rex H., D.D.S.	Klamath Falls, OR	Guldsman, Thomas	Kentfield, CA
Erwin, Alan & Myra	Ashland, OR	Haase, Lu	Klamath Falls, OR
Fahl-King, David	Woolwick, ME	Hahn, Frances M.	Klamath Falls, OR
Farr, A.E.	Klamath Falls, OR	Hald, Christian P.	Ashland, OR
Faurer, William C.	Winters, CA	Hale, Michael	Klamath Falls, OR
Favell, Gene	Klamath Falls, OR	Hall, Stephen, D.M.D.	Klamath Falls, OR
Favell, Winifred	Klamath Falls, OR	Hamilton, J.T.	Medford, OR
Feathergill, Mary	Etna, CA	Hamilton, Keith	Klamath Falls, OR
Feldman, Cliff	Santa Cruz, CA	Hammond, John L.	Portland, OR
Fenai, Leilani	Sacramento, CA	Hamre, Robert & Mary	Seattle, WA
Ferapy, Robert	El Cerrito, CA	Handelman, Carol R.	Berkeley, CA
Ferguson, Joe	Springfield, OR	Hane, Fern & John	Roseburg, OR
Fisch, Andrew R.	Sacramento, CA	Hanlin, Warren L.	Medford, OR
Fishman, Charlotte	San Francisco, CA	Hannigan, Gill	Klamath Falls, OR
Fitzgerald, Michael J.	Bonanza, OR	Hansen, Douglas	Dairy, OR
Flanigan, M.	San Francisco, CA	Hansen, Ted	Klamath Falls, OR
Flury, Paul W.	Klamath Falls, OR	Hanson, Richard B.	Sacramento, CA
Force, T.S.	Calpella, CA	Harper, Steven	Klamath Falls, OR
Foster, J.D.	Ashland, OR	Harrahill, Robert D.	Klamath Falls, OR
Frisbie, Ray E.	Medford, OR	Harris, Carl J.	Klamath Falls, OR
Fritz, B.E.	Lake Oswego, OR	Harris, J.V.	Shingle Springs, CA
Froland, Jim	Carlotta, CA	Harris, Peter D.	San Francisco, CA
Gailey, Mark A.	Chico, CA	Harris, Victoria	Menlo Park, CA
Gallagher, Kent W.	Auburn, CA	Hartfield, Carl	West Linn, OR
Gansberg, James F.	Klamath Falls, OR	Hartfield, Wanda	Klamath Falls, OR
Gansberg, Jeannette	Klamath Falls, OR	Harvey, Dave	Lake Isabella, CA
Garrard, Mary L.	Portland, OR	Hasbrouck, Richard C.	Oakland, CA
Garvey, Jim M.	Klamath Falls, OR	Hatfield, David	Myrtle Point, OR
Gaspari, Richard V.	Klamath Falls, OR	Haughey, Mary	Nevada City, CA
Gebhardt, Steve	Klamath Falls, OR	Hauty, Michael	Portland, OR
George, Jules	Prescott, AZ	Haye, Stan	Independence, CA
Gerdes, Jennifer	Mt. Shasta, CA	Hedges, Susan & Tom	Berkeley, CA
Germain, Michael	Woodland, CA	Heller, Marc & Beth	Ashland, OR
Gibson, Jay O., M.D.	Chico, CA	Henderson, Bob	Klamath Falls, OR
Gilman, Edwin	Klamath Falls, OR	Henderson, Rob	Klamath Falls, OR
Gjertsen, Eugene G.	Klamath Falls, OR	Herring, Douglas	Berkeley, CA
Godwin, Mitch	Lotus, CA	Hess, David S.	Fair Oaks, CA
Goebel, Paul	Klamath Falls, OR	Hess, Steve	Medford, OR
Goetzi, Nancy E.	Berkeley, CA	Hester, Milda	Volcano, CA
Goldsworthy, Elizabeth	Roseville, CA	Hickmann, Heather	Talent, OR
Gooding, Arlene	Klamath Falls, OR	Hicks, Neil	Klamath Falls, OR
Gooding, Steve	Klamath Falls, OR	Hiestand, K.	Challenge, CA
Gookin, Jack M.	Pittsburgh, CA	Hilyard, Jean	Klamath Falls, OR

Hilyard, Garret
 Hjost, Clarence
 Hobbs, Johnnie G.
 Hoffbuhr, Walter H.
 Hoffman, Joyce
 Hoffmann, Brian
 Hoggard, James
 Holmes, Katherine
 Holzgang, Dolores
 Holzwarth, Charlene M.
 Horenstein, Julie
 Horton, John C.
 Houston, Harvey
 Howard, Robert L.
 Hubbard, Susan
 Humble, Brian
 Hummel, Donald L.
 Hurley, Matt
 Hutchinson, Bruce
 Hutchinson, George B.
 Hutchison, Fred H.
 Hyde, Gerta
 Hyun, David
 Infusino, Tom
 James, Leonard
 Jarnsworth, N.
 Javens, Mr. & Mrs. Merlyn
 Jensen, Kathy
 Johnson, Darrow R.
 Johnson, Justin
 Johnson, Ronald E.
 Jones, Consuelo
 Jones, Don
 Jones, Donald H.
 Jones, Herbert A.
 Jones, Kathy
 Jones, Lawrence A.
 Jones, Lowel C.
 Jones, Lowell N.
 Jones, Paul W., Jr.
 Jones, Robert E.
 Jordan, David & Laurence
 Jordan, Jim
 Juncoza, Adrian M.
 Kabcenell, Dirk & Charlene
 Kahmann, Brent
 Kalita, Brad
 Kandus, Colleen N.
 Kasper, Patricia J.
 Kehnle, Janice
 Kelberlau, Barbara
 Keller, Donna
 Keller, Guy
 Keller, Jeff
 Keller, Joseph A.
 Keller, Larry
 Keller, Marguerite E.

Klamath Falls, OR
 Oroville, CA
 Yreka, CA
 Ashland, OR
 Klamath Falls, OR
 Sacramento, CA
 Chico, CA
 Davis, CA
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 Portland, OR
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 Yreka, CA
 Salem, OR
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 Dunsmuir, CA
 Davis, CA
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 Penn Valley, CA
 Atherton, CA
 Yreka, CA
 Ithica, NY
 Klamath Falls, OR
 Klamath Falls, OR
 Klamath Falls, OR
 Bonanza, OR
 Portland, OR
 Winters, CA
 Davis, CA
 Portola Valley, CA
 Arcata, CA
 Chiloquin, OR
 Arcata, CA
 San Jose, CA
 Redding, CA
 El Segundo, CA
 Gresham, OR
 Seattle, WA
 Gresham, OR
 Boring, OR
 Los Gatos, CA
 Oregon City, OR

Kelso, Kay
 Kemp, Roberta A.
 Kent, Betty L.
 Kent, Earl B.
 Kent, Michael
 Kentner, Ed
 Killen, Ronald
 Kimura, Matt
 King, Jean
 Kircher, Glen
 Kish, Gary
 Klahn, Larry G.
 Kluger, Dan
 Klus, Al
 Knight, Doug
 Knopf, Clay
 Knoppensburg, Scott
 Knox, Scott S.
 Koehler, Fred W.
 Koehler, Ruth
 Koutsy, Carl D.
 Krissoff, William B.
 Kruger, Erich
 Kuhlemann, Bruce
 Kunze, John
 Kupfer, Michael D.
 Kurth, James A.
 LaHaye, Gordon G.
 LaPorta Family
 Lafferty, William
 Lafrentz, John
 Lagerquist, Tom
 Lague, Richard E.
 Laitner, Larry
 Lamborn, Celia & Omer
 Land, Willard
 Lander, Bob & Judy
 Landrum, Frank
 Langer, Lew
 Langner, M.
 Lantis, Barbara
 Lantow, Brian & Michelle
 Largman, Corey
 Larson, Norman L.
 Laubacher, Joe
 Lauer, Kurt
 Lauter, Samuel H.
 Laver, Robert
 Laver, Shirlee
 Lawrence, Julio
 Lawson, Dr. James L.
 Lawson, Marge
 LeBraco, Traci C.
 Leach, Eugene R.
 Leard, Jim
 Ledgerwood, Richard
 Lee, Paul

Sacramento, CA
 San Rafael, CA
 Klamath Falls, OR
 Klamath Falls, OR
 San Francisco, CA
 Klamath Falls, OR
 Gresham, OR
 Placerville, CA
 Livermore, CA
 Chiloquin, OR
 Sauvie Island, OR
 Klamath Falls, OR
 San Francisco, CA
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 Sacramento, CA
 Arcata, CA
 Morro Bay, CA
 Talent, OR
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 Truckee, CA
 Sunnyvale, CA
 Hayward, CA
 Klamath Falls, OR
 Mountain View, CA
 Klamath Falls, OR
 San Francisco, CA
 San Rafael, CA
 San Francisco, CA
 San Jose, CA
 Orangevale, CA
 Corvallis, OR
 Ashland, OR
 Canoga Park, CA
 Klamath Falls, OR
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 Moss Landing, CA
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 Mountain View, CA
 Berkeley, CA
 Mt. Shasta, CA
 Montague, CA
 Yreka, CA
 San Francisco, CA
 Klamath Falls, OR
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 Orland, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Grass Valley, CA
 Redding, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Portland, OR

Lehmann, B.F.
 Leidwinger, Lou
 Leier, Kathy
 Lemkiul, Jeanne
 Lepley, Mark
 Lesueur, Bemice
 Lesueur, Lance
 Levy, Jon
 Lewis, Mildred & Glenn
 Lewis, Susan
 Leydig, Margaret
 Libkind, Marcus
 Liimata, Into
 Lincoln, Robert L.
 Linde, Carole
 Lindow, Ted
 Lohn, Dave
 London, David & Valerie
 Long, Barbara E.
 Lowry, Joe A.
 Lyon, Max
 MacGregor, Caroline
 MacKenzie, Ken
 Maddox, Andrew
 Maddox, Jerry
 Maddox, Ramona
 Madol, Stuart W.
 Magnuson, Arvid, M.D.
 Maguire, Ruthann
 Mah, Temigin K.
 Mahaffey, Billie
 Maida, Nino
 Majeski, Joan E.
 Malbon, R.M.
 Malchiori, Raymond
 Mancl, Arthur E.
 Markley, Susan
 Marr, Ted
 Marsh, Susan
 Marshall, Harry
 Marstad, Chris
 Martin, Frances V.
 Martinez, Toni
 Mason, Michael D.
 Matchett, Lee W.
 Matejsek, Jaroslav D.
 Matyas, Betty
 Maul, Dr. T.L.
 Maxwell, David A.
 McCall Family
 McCann, Catherine
 McCluskey, Valerie
 McCrary, Edward & Mary Jo
 McCurdy, Grier
 McDonald, Barbara
 McDonell, Ronald E.
 McFetudge, Mike & Mary

Klamath Falls, OR
 Klamath Falls, OR
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 Sacramento, CA
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 Crescent City, CA
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 Menlo Park, CA
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 Livermore, CA
 Beaverton, OR
 Los Altos, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Sacramento, CA
 Mountain View, CA
 Merrill, OR
 Eugene, OR
 Woodside, CA
 Fair Oaks, CA
 Antioch, CA
 Klamath Falls, OR
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 Sebastopol, CA
 Yreka, CA
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 San Francisco, CA
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 Santa Cruz, CA
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 Menlo Park, CA
 Klamath Falls, OR
 Klamath Falls, OR
 North Hollywood, CA
 Talent, OR
 Portland, OR
 Klamath Falls, OR
 Klamath Falls, OR
 Sacramento, CA
 Riverside, CA
 Klamath Falls, OR
 Walnut Creek, CA
 Hillsborough, CA
 Klamath Falls, OR
 Klamath Falls, OR
 San Francisco, CA
 Klamath Falls, OR
 Sebastopol, CA
 Salem, OR

McGeary, Craig
 McGinnis, William
 McGuire, Glen J.
 McInroy, Bud
 McKinsey, Margaret
 McLeod, Betty
 McManus, Sherry
 McNeil, Janie
 McVay, Ronald
 Mendelsohn, Steven
 Met, Viktor
 Meyer, John
 Michaels, Forrest
 Mick, Bob
 Mick, Carol
 Miesse, William
 Milbury, Peter G.
 Miller, Gale
 Miller, John
 Miller, Melvin
 Miller, Michael C.
 Miller, Neal
 Miller, William
 Millikan, Clare
 Mills, Kate
 Mischinsky, Jeffrey
 Moden, Donna
 Molatore, H.D.
 Molatore, Harry
 Molatore, Jerry
 Moniz, Elda & George
 Monson, Wayne
 Mooney, Sue
 Moore, Clara
 Moore, Trey
 Morales, Linda C.
 Moran, Martha Sue
 Morehead, Paul
 Morena, David
 Morgan, James
 Morris, Gene R.
 Morris, Louisa K.
 Morrison, Donald J.
 Morrison, Richard
 Morrow, JoAnn
 Morse, A.K.
 Morstad, Leo
 Murray, Tom
 Myers, Charles H.
 Nath, John H. & Jean M.
 Neeley, Clinton C.
 Neier, Gene
 Neitling, Mary
 Neitling, Stanley
 Nelson, Diana
 Nelson, Michael W.
 Nelson, Randy

Klamath Falls, OR
 El Sobrante, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Ashland, OR
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 Sacramento, CA
 Malin, OR
 Redding, CA
 Medford, OR
 Salem, OR
 Scotts Valley, CA
 Klamath Falls, OR
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 Mt. Shasta, CA
 Chico, CA
 Mapleton, OR
 Palo Alto, CA
 Klamath Falls, OR
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 Challenge, CA
 Klamath Falls, OR
 Kensington, CA
 Mt. Hood, OR
 Davis, CA
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 Livermore, CA
 Wilton, CA
 El Sobrante, CA
 Klamath Falls, OR
 Bakersfield, CA
 Bakersfield, CA
 Alma, CO
 Joseph, OR
 Santa Monica, CA
 Mountain View, CA
 Ashland, OR
 San Francisco, CA
 Klamath Falls, OR
 Lafayette, CA
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 Medford, OR
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 Corvallis, OR
 Central Point, OR
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Nelson, Robert E.
 Ness, Suzanne
 Newbry, Lyndel W.
 Newton, Christopher
 Nicely, DeEtta
 Nichols, Gary
 Niedermeyer, C. Lee
 Nitschelm, George
 Noble, Mary
 Noelle, Christine
 Noonan, Bill
 Noonan, Rosemarie
 Norland, Hans
 Norman, Debbie
 Norman, Sherman
 Norris, Frank
 Nunes, Tony M.
 O'Connor, Jack
 O'Hair, Mike
 Ogden, Larry
 Oliver, Stuart M.
 Olshan, Murray & Phyllis
 Orcutt, Guy
 Orem, Harry
 Ormsbee, Barbara
 Osborn, Kay
 Ostertag, George & Rhonda
 Overmyer, Dianna & David
 Owens, Bruce & Marie
 Pallies, Bob
 Parker, Gwen
 Parkinson, Thomas M.
 Passien, E.
 Patten, Jack
 Paulus, Ted R.
 Pavey, Laurie
 Peckham, Lamar
 Peil, Tom
 Pella, Mary Anne
 Pennington, Paula
 Peoples, Scott
 Perkins, John M.
 Perske, Douglass
 Peter, Coy & Mary
 Petersen, Stan
 Petrofsky, Mary
 Phearson, Howard A.
 Pherffer, Rod
 Pittman, Smokey
 Plant, Graeme D., III
 Porpiglia, Randy
 Potter, John R.
 Powers, Fay
 Powley, Tom L.
 Preschutti, John
 Presley, Davis G.
 Pribble, Ron

Medford, OR
 Sacramento, CA
 Talent, OR
 Klamath Falls, OR
 Seaside, CA
 Klamath Falls, OR
 Central Point, OR
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 Bonanza, OR
 Albany, CA
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 Seattle, WA
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 El Sobrante, CA
 Redding, CA
 Sepulveda, CA
 Portland, OR
 Merrill, OR
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 Coloma, CA
 Salem, OR
 San Rafael, CA
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 San Jose, CA
 Palo Alto, CA
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 Grants Pass, OR
 Oregon City, OR
 Santa Rosa, CA
 Truckee, CA
 Chico, CA
 Markleeville, CA
 Fair Oaks, CA
 Keno, OR
 Chico, CA
 Klamath Falls, OR
 Wawona, CA
 San Francisco, CA
 Klamath Falls, OR
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 Placerville, CA
 San Francisco, CA
 Citrus Heights, CA
 Corvallis, OR
 Montague, CA
 Klamath Falls, OR
 Blairsden, CA
 Yreka, CA
 Klamath Falls, OR

Price, Steven V.
 Purdy, Mark
 Purtzer, Dan
 Putman, Jon
 Quigley, April
 Rainbolt, Jack
 Rajnus, William
 Rand, Deirdre & Randy
 Rathbone, Mary
 Ray, Paula
 Recht, Fran
 Reed, James E.
 Reese, Delbert
 Reeves, Enid M.
 Reid, Merrill I.
 Reinhart, A. Troy
 Reves, Larry
 Rhodes, Chuck
 Richards, Lyle
 Richardson, Schuyler
 Richman, Max & Marlys
 Rickards, R.D.
 Riker, Joseph T.
 Riker, Joseph T., III
 Ring, Dale
 Ring, Virginia
 Ritzman, Jane
 Rivers, Walter
 Roberts, Betty M.
 Roberts, Richard P.
 Robinson, Kenneth H.
 Rockett, Melody
 Roehr, Bill
 Rogers, James & Cora
 Roller, Ken
 Roller, Thelma
 Ronningen, Ken
 Rookstool, Jack
 Rookstool, Lester
 Rose, Greg
 Ross, Bob
 Ross, Rumi
 Roster, Tom and Jeanne
 Roufs, Barbara L.
 Ruddell, Rebecca S.
 Ruiz, Jesse
 Rush, Harold
 Rychetmik, Joe
 Safley, Bertha
 Safley, Gary, M.D.
 Safley, Gordon
 Safley, Wayne H.
 Sagunsky, Byron T.
 Salley, Karen L.
 Sanda, Belinda & Gary
 Sander, William J.
 Sanders, Rex

Seattle, WA
 Napa, CA
 Redding, CA
 Klamath Falls, OR
 Crescent City, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Mill Valley, CA
 Klamath Falls, OR
 Berkeley, CA
 Newport, OR
 Oakland, CA
 Klamath Falls, OR
 Placerville, CA
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 Roseburg, OR
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 Tahoe City, CA
 Cottonwood, CA
 Klamath Falls, OR
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 Weaverville, CA
 Larkspur, CA
 Klamath Falls, OR
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 Sebastopol, CA
 Quincy, CA
 Grass Valley, CA
 Chiloquin, OR
 Klamath Falls, OR
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 Sonoma, CA
 Klamath Falls, OR
 Nevada City, CA
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 Bakersfield, CA
 Roseburg, OR
 Pacific Grove, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Medford, OR
 Klamath Falls, OR
 Klamath Falls, OR
 Ashland, OR
 Redding, CA
 Pacific Crest, CA
 Palo Alto, CA

Sandmeyer, John	Klamath Falls, OR	Stanley, Taya	San Marcos, TX
Sartor, Melissa	Mt. Shasta, CA	Stastny, Ed	Malin, OR
Saufley, Frost	Boulder Creek, CA	Staunton, J. Marshall	Tulelake, CA
Saveland, Michael W.	Klamath Falls, OR	Steademan, Dudley	Keno, OR
Schell, Gloria	Klamath Falls, OR	Stearns, Anita	Klamath Falls, OR
Schill, Leanna	Klamath Falls, OR	Steele, David	Keno, OR
Schmelzer, Robert	Mariposa, CA	Steffensen, MaryLee	Forest Glen, CA
Schmidt, Kurt	Klamath Falls, OR	Steinberg, Dr. & Mrs. Daniel	Livermore, CA
Schneider, David L.	Berkeley, CA	Steinberger, Joseph	San Francisco, CA
Schouten, Dick A.	Redding, CA	Steward, Albert	Klamath Falls, OR
Schultz, Charles	San Rafael, CA	Steward, Bob	Klamath Falls, OR
Scofield, Robert D.	Medford, OR	Stewart, Larry	Klamath Falls, OR
Scott, Gayle	Klamath Falls, OR	Stewart, Paul R.	Klamath Falls, OR
Seely, Chris	Klamath Falls, OR	Stilwell, Fred W.	Klamath Falls, OR
Setchler, Kevin K.	Santa Rosa, CA	Stilwell, Irene	Klamath Falls, OR
Seutter, Marge	Klamath Falls, OR	Stilwell, Jim	Klamath Falls, OR
Sexton, Dick	Klamath Falls, OR	Stinebaugh, S.J.	Grants Pass, OR
Sexton, Gen H.	Klamath Falls, OR	Stocks, Rick	Chico, CA
Shaw, Bonnie	Klamath Falls, OR	Stoltz, Mr. & Mrs. James	Martinez, CA
Shaw, Thomas J.	Klamath Falls, OR	Stone, Albert	Klamath Falls, OR
Sherman, Harvey	Sebastopol, CA	Stone, Barbara	Klamath Falls, OR
Shoemaker, Stacey A.	Lake Shastina, CA	Stone, Jeff	Alturas, CA
Shoff, Diane E.	Shingle Springs, CA	Stone, Ned W.	El Cerrito, CA
Short, Ronald C.	Klamath Falls, OR	Stoner, Pamela	Klamath Falls, OR
Silver, Daniel, M.D.	Los Angeles, CA	Stouch, L.	Portland, OR
Simmons, Bradford & Dorcas	Inverness, CA	Stratton Family	Felton, CA
Sine, Kay	Klamath Falls, OR	Straus, Jane	Oakland, CA
Sisto, Darryl D.	Klamath Falls, OR	Strauss, George & Helene	Berkeley, CA
Skemp, Karyn D.	Santa Cruz, CA	Stromsness, Chris	Dunsmuir, CA
Slade, R.L.	Klamath Falls, OR	Stroshane, Tim	Richmond, CA
Slater, Keith	Napa, CA	Suk, Tom	Prescott, AZ
Smallen, Mark & Marcy	Oakland, CA	Swanson, John R.	Minneapolis, MN
Smith, Mr. & Mrs. Donald	Las Vegas, NV	Swift, Susan	Sacramento, CA
Smith, Cyrus L.	Klamath Falls, OR	Swisher, Mark	Talent, OR
Smith, Ernestine I.	Santa Rosa, CA	Taber, Kelley M.	Sacramento, CA
Smith, Herman F.	Klamath Falls, OR	Tacchini, Keven	Klamath Falls, OR
Smith, Jean A.	Mill Valley, CA	Taylor, Michael	Etna, CA
Smith, Josh	Klamath Falls, OR	Taylor, Paul B.	Smartville, CA
Smith, Lane	Klamath Falls, OR	Taylor, Roger G.	Malin, OR
Smith, Mel	Klamath Falls, OR	Teague, Donald	Montague, CA
Smith, Rachel K.	El Granada, CA	Tepper, James M.	Klamath Falls, OR
Smith, Ronald D.	Klamath Falls, OR	Terhune, David	Klamath Falls, OR
Smith, Susan	Fremont, CA	Terrill, Ken	Blue Lake, CA
Snider, Kyle E.	Davis, CA	Theotig, Georgette	Tehachapi, CA
Snively, Cel	Klamath Falls, OR	Thoele, Gwen	San Francisco, CA
Snively, Les	Klamath Falls, OR	Thom, Theodore E.	Klamath Falls, OR
Snow, Howard A.	Klamath Falls, OR	Thomas, William S.	Santa Barbara, CA
Sokale, Jana	Fremont, CA	Thompson, Danette	Klamath Falls, OR
Solomon, Andrea J.	Sacramento, CA	Thompson, Gilbert & Mary	Klamath Falls, OR
Sorenson, Steve	Klamath Falls, OR	Thomson, James	Lotus, CA
Sotcher, Frances	Hawthorne, CA	Tinniswood, W.	Klamath Falls, OR
Spencer, Mary Kate	Menlo Park, CA	Tinsley, Thomas E., Jr.	Springfield, OR
Spillar, Walton & Ruth	Klamath Falls, OR	Todd, Guy	Klamath Falls, OR
Spotts, Richard	Sacramento, CA	Tracy, Kim	San Francisco, CA
Spruance, Raymond A.	San Francisco, CA	Tracy, Nancy Lou	Portland, OR
Spurgeon, Jill	Portland, OR	Tranby, Craig	Walnut Creek, CA
Staley, Gail	Klamath Falls, OR	Tremaine, Paul & Barbara	Klamath Falls, OR

Truax, Lola	Klamath Falls, OR	Wiley, Carol A.	Victorville, CA
Tucker, Lester J.	Klamath Falls, OR	Wilke, Jo	Chico, CA
Tyler, Pat	Forest Knolls, CA	Willis, Dave	Ashland, OR
Tyrholm, Mike	Klamath Falls, OR	Wilson, Lillian L.	Klamath Falls, OR
Uerlings, James	Klamath Falls, OR	Wilson, Lloyd V.	Klamath Falls, OR
Ulloth, John J.	Sacramento, CA	Wilson, Ron	Portola Valley, CA
Unger, Dan	Sonora, CA	Wilson, Sara Leigh	Oregon City, OR
Unger, Zuc	Oakland, CA	Windman, Susan	San Anselmo, CA
Urquhart, Alvin	Eugene, OR	Winkleblack, Ken	Orangevale, CA
Valens, Dan M.	Elkton, OR	Winter, Richard P.	Klamath Falls, OR
Valle-Riestra, Christopher P.	Oakland, CA	Winternitz, William W., Jr.	Davis, CA
VanDyke, Nancey A.	Orangevale, CA	Wise, Bob	Sacramento, CA
VanFleet, Bryon	Klamath Falls, OR	Wiseman, Ben	Klamath Falls, OR
Van Scoyoc, David	Dorris, CA	Wolfard, Horace G.	Central Point, OR
Varian, Kerri L.	Berkeley, CA	Wolff, David	Sacramento, CA
Veronda, Barbara J.	Penngrove, CA	Zim, Irwin D.	Hillsborough, CA
Versteeg, Vera A.	Minneapolis, MN		
Versteeg, Victor	Klamath Falls, OR		
Wales, Diana	Roseburg, OR		
Walicki, Joe	Marylhurst, OR		
Walker, Bill	Redding, CA		
Wallace, David R.	Berkeley, CA		
Walling, Catherine	Arcata, CA		
Walton, Christy	National City, CA		
Warburg, Karen	Mt. Shasta, CA		
Ward, Anita	Klamath Falls, OR		
Ward, Jim	Klamath Falls, OR		
Ward, Patrick	Klamath Falls, OR		
Waring, Richard and Doris	Corvallis, OR		
Warr, Erin	El Sobrante, CA		
Wasielewski, Jeff	Santa Clara, CA		
Wasson, Tim & Lori	Klamath Falls, OR		
Watson, James E.	Coos Bay, OR		
Watson, Robert W.	Klamath Falls, OR		
Watson, Susan	Orinda, CA		
Wayburn, L. Virginia	Klamath Falls, OR		
Wayburn, Lew	Klamath Falls, OR		
Wehmeyer, Larry	Grenada, CA		
Weider, Kraig B.	Klamath Falls, OR		
Weinberg, William	San Francisco, CA		
Weiss, Edward R.	Auburn, CA		
Weissberg, Muriel	Redding, CA		
Wendt, Mr. & Mrs. Richard	Klamath Falls, OR		
Werich, Richard C.	Ashland, OR		
Werner, Lynn	San Francisco, CA		
Werschull, Grant D.	Sacramento, CA		
West, Charles	Paradise, CA		
West, Wendy	Coloma, CA		
Westerfield, James R.	Medford, OR		
Weston, Scott	San Ramon, CA		
Wettle, Chris	Klamath Falls, OR		
White, Bruce W.	Bend, OR		
White, Eric	Los Altos, CA		
White, Robert C.	Klamath Falls, OR		
Whitlatch, Julie	Klamath Falls, OR		
Wiese, Tracey	Twisp, WA		
Wilczynski, John	Klamath Falls, OR		

Businesses

Advanced Energy Engineering
All Seasons Sports
Associated Chambers of Commerce
Barnhisel/Ganong
Basin EyeCare
Robert J. Bogatay Construction
Floyd A. Boyd, Co.
C & N Home Health Care, Inc.
Century 21 Production Realty, Inc.
Champion Securities
Chuck Fisher Realtors
Columbia Plywood Corporation
Crest Fashion and Modeling Academy
ERA Nicholson & Associates
Effective Slide Presentations
Equine Medicine & Surgery
Fahner Farms, Inc.
Grinnel Properties
Hazel Company
Hetland & Hansen
Holman Realty, Inc.
JNS Excavation
John H. Jaques, Inc.
J.W. Kerns, Co.
Klamath Canyon River Outfitters
Klamath County Chamber of Commerce
Lake County Chamber of Commerce
Mennen Beard, Winebrokers
Merle West Medical Center
Mountain Title Co.
Northwest Audio & Telecom
Novak's Auto Parts
Oregon Laser Consultants
Pacific Therapy Center
Rapid Shooters Photography
Rookstool-Hansen Real Estate
Shasta-Cascade Wonderland Association
Shirley's Fashion Boutique
Siskiyou County Visitor's Bureau
Starr's Masonry & Tile
Turtle River Rafting Company
Whitewater Connection
Whitewater Voyages/River Exploration Ltd.
Wildfires Stable
Wynne Broadcasting Co.

Organizations

Adventure Outings, ASCSU Chico
American Rivers
Ancient Forest Defense Fund
Associated Oregon Industries
California Department of Water Resources

Yates, Scott
Drew, Neil
Marks, Wayne L.
Ganong, Frank F.
Creed, Dr. Robert W.
Bogatay, Robert J.
Boyd, Donald A.
Souders, Carolyn V.
Matthews, Allan
Champion, Bob
Fisher, Chuck
Slezak, Mark
Creed, Kristine
Nicholson, Gayle
Hooper, Jon & Catherine
Boyer, Steven L.
Fahner, Fredrick, W.
Roos, Page
Hazel, Pat
Hansen, Charles A.
Holman, Hank & Pat
Nickelson, John
Jaques, John H.
Kerns, James W.
Munroe, Dean
Jackson, Beverly
Gover, Barbara
Mennen, Peter
Arnold, David R.
Stelle, Linda
Wilson, Ellis & Lauri
Novak, John & Paul
Deutschman, William A.
Sochet, Marty
Leder-Adams, Mark
Rookstool, Sonya
Reginato, John F.
Johnson, Shirley M.
Rucker, Jo Ann
Starr, K.
Wikander, David
Kirk, Richard S.
McGinnis, William
White, Marie C.
Wynne, Floyd L.

McNutt, Roland
Coyle, Kevin J.
Day, Steven
Donaca, Thomas C.
Gentry, Wayne S.

San Anselmo, CA
Klamath Falls, OR
Yreka, CA
Klamath Falls, OR
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Merrill, OR
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San Francisco, CA
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Novato, CA
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Redding, CA
Klamath, Falls OR
Lakeview, OR
St. Helena, CA
Klamath Falls, OR
Klamath Falls, OR
Klamath Falls, OR
Klamath Falls, OR
Klamath Falls, OR
Lafayette, CA
Lotus, CA
Klamath Falls, OR
Redding, CA
Klamath Falls, OR
Horse Creek, CA
Mt. Shasta, CA
Mt. Shasta, CA
Coloma, CA
El Sobrante, CA
Klamath Falls, OR
Klamath Falls, OR

Chico, CA
Washington, DC
Leggett, CA
Salem, OR
Red Bluff, CA

Ecology Center of Southern California
 Friends of the River
 Friends of Walker Creek Wetlands
 Klamath Basin Audubon Society
 Klamath County Economic Development Assn.
 Lane County Audubon Society
 Madrone Audubon Society, Inc.
 NW Rafter's Assoc., Klamath Chapter
 Napa-Solano Audubon Society
 Oregon Farm Bureau
 Oregon Forest Industries Council
 Oregon Rivers Council
 Oregon Trout
 Oregon Water Resources Congress
 Placer Conservation Force
 Planning and Conservation League
 Rogue Flyfishers
 Rogue Valley Audubon Society
 Sacramento River Preservation Trust
 Save Our Klamath Jobs
 Save Our Klamath River
 Sierra Club, Loma Prieta Chapter
 Sierra Club, Redwood Chapter, North Group
 Sonoma Student Union, Sonoma University
 Tulelake Growers Association

Pearlman, Nancy
 Evans, Steven L.
 Armstrong, Judith M.
 Opp, Charlotte G.
 Riker, Joan F.
 Farley, Arthur M.
 Bentley, Martha C.
 Bryan, Randy
 Leong, Robin L.C.
 Breese, Douglas H.
 Armstrong, Ward
 Doppelt, Bob
 Simpson-Myron, Kathleen
 Russell, Don
 Wauters, Helen
 Meral, Gerald
 MacDiarmid, John M.
 Janes, Dr. Stewart W.
 Stockton, Ken
 Beach, Bob
 Nichols, Gary
 Barr, Linda S.
 Van Kirk, Susie
 Berkowitz, Bruce
 Heiney, Bill

Los Angeles, CA
 Sacramento, CA
 Salem, OR
 Klamath Falls, OR
 Klamath Falls, OR
 Eugene, OR
 Santa Rosa, CA
 Klamath Falls, OR
 Vallejo, CA
 Salem, OR
 Salem, OR
 Eugene, OR
 Canby, OR
 Bend, OR
 Newcastle, CA
 Sacramento, CA
 Medford, OR
 Medford, OR
 Redding, CA
 Klamath Falls, OR
 Klamath Falls, OR
 Palo Alto, CA
 Arcata, CA
 Rohnert Park, CA
 Tulelake, CA

Cities and Counties

City of Bend
 City of Klamath Falls
 City of Mitchell
 City of Philomath
 City of Prairie City
 City of Prineville
 City of Prineville
 City of Prineville
 Deschutes County Board of Commissioners
 Klamath County Board of Commissioners
 Klamath County Planning

Kozak, Michael
 Keller, James
 Denfeld, Dennis
 Gay, Jeannine A.
 McKinley, Roger
 Blank, Gerald
 Dragich, Hugh
 Vallie, Todd
 Throop, Tom
 Fredricks, Harry J.
 Shuck, Carl

Bend, OR
 Klamath Falls, OR
 Mitchell, OR
 Philomath, OR
 Prairie City, OR
 Prineville, OR
 Prineville, OR
 Prineville, OR
 Bend, OR
 Klamath Falls, OR
 Klamath Falls, OR

State and Federal Agencies

Bureau of Reclamation
 California Office of Planning & Research
 Federal Energy Regulatory Commission
 Klamath River Compact Commission
 Klamath Tribe
 Oregon House of Representatives
 Oregon House of Representatives
 Oregon House of Representatives
 Oregon House of Representatives
 Oregon House of Representatives
 Oregon House of Representatives

Fults, Dan
 Martinez, Robert P.
 Shumway, Dean L.
 Kuonen, Nell
 Schonchin, Lynn, Jr.
 Jones, Delna
 Mannix, Kevin
 Markham, Bill
 Oakley, Carolyn
 Norris, C.R.
 Agrons, B.Z.
 Campbell, Larry L.

Sacramento, CA
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 Washington, DC
 Klamath Falls, OR
 Chiloquin, OR
 Aloha, OR
 Salem, OR
 Salem, OR
 Salem, OR
 Hermiston, OR
 Klamath Falls, OR
 Salem, OR

Oregon House of Representatives
Oregon House of Representatives
Oregon State Senate
Oregon State Senate
Oregon State Senate
State Parks and Recreation Division
USDI/Fish & Wildlife Service

Jones, Denny E.
Wehage, Rodger
Bradbury, Bill
Kintigh, Bob
Otto, Glenn E.
Lilly, John E.
Peterson, Russell D.

Ontario, OR
Portland, OR
Bandon, OR
Springfield, OR
Salem, OR
Salem, OR
Portland, OR

The Bureau of Land Management's Klamath Falls Resource Area Office regrets if your name, business, or organization was omitted or misspelled.

Glossary

Adjudication - To hear and settle a case by judicial procedure.

Allotment - An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federal managed, state owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Anadromous Fish - Fish that migrate as adults from the ocean into fresh water streams to reproduce young fish that migrate to the ocean to grow to maturity.

Animal Unit Months (AUMs) - The amount of forage necessary for the sustenance of one cow or its equivalent for one month.

Aquatic Habitat - Habitat that occurs in free water.

Archaeological Site - A cultural resource containing material remains of prehistoric and/or historic human activity.

Archaeological Survey (Class III - Intensive Field Inventory) - Continuous, intensive survey of an entire target area; aimed at locating and recording all cultural properties that have surface and exposed-profile indications.

Area of Critical Environmental Concern (ACEC) - An area within the public lands where special management attention is required (if such an area is developed or used, or where no development is permitted) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes or to protect life and safety from natural hazards (FLPMA Sec. 103(a)).

Artifact - An object that shows evidence of human manufacture, modification, or use. Commonly used to refer to prehistoric items, such as implements made of stone, bone, pottery, or other durable material.

Aspect - The direction a slope faces.

Best Management Practices - A practice or combination of practices determined by a State, after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective and practicable (including techno-

logical, economic, and institutional considerations) means of preventing or reducing the amount of water pollution generated by nonpoint sources to a level compatible with water quality goals.

Big Game - Large mammals, some of which are hunted; e.g., Roosevelt elk, black-tailed deer, black bear; others, such as the endangered Columbian white tailed deer, are fully protected.

Biochemical Oxygen Demand - A measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria. This is a useful way to express stream pollution loads.

Broadcast Burning - A controlled fire which burns within well defined boundaries for reduction of fire hazard, as a silvicultural treatment, or for wildlife habitat improvement.

Candidate Species - Those plants and animals included in Federal Register "Notice of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered.

Category 2 - Taxa for which the FWS has information to indicate that listing is possibly appropriate. Additional information is being collected.

Commercial Forest Land - Forest land that is now producing or is capable of producing at least 20 cubic feet of wood per acre per year of commercial tree species.

Cover - Vegetation used by wildlife for protection from predators, or to ameliorate conditions of weather, or in which to reproduce; fish cover may consist of deep water, undercut banks, submerged logs, or overhanging vegetation.

Critical Winter Range - A specific area within a general winter range that receives a higher degree of use and is of greater significance to migrating deer and elk during the winter months.

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Diversity - A measure of the variety of species and habitat in an area that takes into account the relative abundance of each species or habitat.

Early Serai Stage - The time period in the life of a forest stand from disturbance (natural or man-caused) until canopy closure (when crown cover approaches 100 percent).

En Echelon - Parallel structural features that are offset like the edges of shingles on a roof.

Endangered Species - Any species published in the Federal Register as in danger of extinction through all or a significant portion of its range.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major Federal action.

Epos - (*Perideridia gairdneri*) An annual flowering plant used by Native Americans for food and medicinal purposes.

Eyrie(s) - Nest of a predatory bird built in a high, inaccessible location.

Flow Regime - Management or manipulation of water flows.

Forage - All browse and herbaceous foods that are available to grazing animals including wildlife and domestic livestock.

Forebay - An expanded channel at the downstream end of a power conduit which provides water storage, surge control, and absorbs water flow variations.

Habitat Diversity - The number of different types of habitat within a given area.

Hack Site - Reintroducing a raptor to a specific area by bringing in young and artificially feeding them until they reach maturity.

High Intensity Forest Lands - Commercial forest lands that are suitable for continuous timber production with reasonable assurance of successful results from the application of intensive management practices, such as precommercial thinning, fertilization, etc.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD 1850 in southeastern Oregon).

Intensive Forest Management Lands - All commercial forest land that is part of the timber production land base.

Late Serai Stage - The period in the life of a forest stand from attainment of an average stand DBH of 12 inches until the culmination of mean annual increment.

Management Framework Plan (MFP) - Land use plan that established coordinated land use allocations for all resource and support activities for a specific land area within a BLM district. It also establishes objectives and constraints for each resource and support activity and provides data for consideration in program planning. (This process has been replaced by the Resource Management Planning process).

Midden - A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

Migration Corridor - A topographic feature and/or vegetative community that provides suitable habitat which animals follow during migration.

Montane Vegetation - Vegetation growing in or inhabiting a mountainous region.

National Register of Historic Places - A formal list, established by the National Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation. The Register lists archaeological, historic, and architectural properties (such as districts, sites, buildings, structures, and objects) nominated for the local, State, or National significance by State and/or Federal Agencies and approved by the National Register staff. The Register is maintained by the National Park Service.

Native American Heritage Sites - Places associated with cultural traditions of Native American groups and may or may not be associated with visible remains or deposits; i.e., traditional gathering locations, significant events in mythology, cemeteries, ethnohistorical habitation sites.

Nonforest Land - Land that has been developed for non-timber uses or land that is incapable of being 10 percent stocked with forest trees.

Nongame Wildlife - All wild terrestrial vertebrates not subject to sport hunting.

Non-point Source Pollution - Pollution caused by the introduction of materials from diffuse sources; e.g., sediments, nutrients, or natural or human alteration in the stream system.

Normal Faults - A fault in which the hanging wall has moved down, relative to the footwall.

Oregon & California (O&C) Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Off-Road Vehicle (ORV) - Any motorized track or wheeled vehicle designed for cross-country travel over any type of natural terrain.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Point Source - Any confined and discrete conveyance from which pollutants are or may be discharged, such as pipes, ditches, channels, funnels, wells, or containers.

Potential ACEC - An area of land administered by BLM which, after review and recommendation by an interdisciplinary team, has been determined by the appropriate BLM District Manager to meet the following criteria:

(1) Relevance. There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard.

(2) Importance. The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.

Prehistoric - Refers to a period wherein Native American cultural activities took place which were not yet influenced by contact with historic non-native culture(s).

Prescribed Fire - A planned burning of live or dead vegetation under favorable conditions which would achieve desired management objectives.

Projectile Point - A sharp tip (usually stone) affixed to the business end of a spear, lance, dart, or arrow.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Radiocarbon Date - A method for determining the age of organic material by measuring the extent to which the radioactive isotope Carbon-14 has decayed into stable nitrogen-14, comparing the observed C-14 fraction with the known half-life of 5568 ± 30 years.

Raptors - Bird species, such as eagle and hawks, which have adapted to seize prey.

Rearing Habitat - Areas in rivers or streams where juvenile salmon and trout find food and shelter to live and grow for a period of time.

Recovery Plan - A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act, for the purpose of improving the status of the species to the point where listing is no longer required.

Recreation Experience Opportunity - The opportunity for a person to realize predictable psychological and physiological outcomes from engaging in a specific recreation activity within a specific setting.

Recreation Opportunity Spectrum (ROS) - A continuum used to characterize recreation opportunities in terms of setting, activity, and experience opportunities. The spectrum contains six classes.

Recreational River - A river or section of a river that is readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment or diversion in the past, which has been designated, as such, as part of the National Wild and Scenic Rivers System.

Resource Classifications - (The term "resource classifications" was used in place of "management designations" to avoid confusion with the term "wild and scenic river designation".)

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the watertable of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows.

Riparian Vegetation - A highly valued vegetation community found near or around rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows. This community type is a product of the vegetation complex and microclimate conditions combined with the presence and influence of perennial and/or intermittent water, associated high water tables, and soils which exhibit some wetness characteristics.

Scenic Quality - The relative worth of a landscape from a visual perception point of view.

Scenic River - A river or section of a river that is free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads, which has been designated as such, as part of the National Wild and Scenic Rivers System.

Seral Stages - The series of relatively transitory plant communities which develop during ecological succession from bare ground to the climax stage.

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging has been completed.

Snag - Any standing dead, partially-dead or defective (cull) tree at least 10 inches in diameter at breast height and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Special Recreation Management Areas (SRMA) - Areas where congressionally recognized recreation values exist or where significant public recreation issues or management concerns occur. Special or more intensive types of management are typically needed.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened, endangered, or sensitive pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class 1 streams are those which are significant for domestic use, angling, water dependent recreation and spawning, rearing or migration of anadromous or game fish. Class 2 streams are: (1) those which have a significant summertime cooling influence on downstream Class 1 streams; or (2) any stream which is not Class 1.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Thermal Cover - Cover used by animals to ameliorate effects of weather. For elk, a stand of conifer trees which are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs or trees at least 5 feet tall with 75 percent crown closure.

Threatened Species - A plant or animal species listed in the Federal Register that the Secretary of the Interior has determined is likely to become endangered within the foreseeable future throughout all or most of its range.

Visual Resources - The visible physical features on a landscape; e.g., land, water, vegetation, animals, structures, and other features.

Visual Resource Management (VRM) - The inventory and planning actions taken to identify visual values and to establish objectives for managing those values; and the management actions taken to achieve the visual management objectives.

Visual Resource Management Classes - Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape. These objectives are described in the BLM Handbook H-8410-1.

Water Quality - The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

References

- Abrams, L. 1944. Illustrated flora of the Pacific states. Vol. II. Stanford University Press, Stanford, California.
- Beyer, Jean M. 1984. Rainbow trout fishery and spawning stock in the Upper Klamath River Wild Trout Area, Copco, California. M.S. Thesis. Humboldt State University, Arcata, California.
- Boyle, John C. 1976. 50 years on the Klamath. Klocker Printery, Medford, Oregon.
- Brock, Richard. 1988. *Calochortus greenei*: habitat and threat analysis. Research report, The Hardman Foundation, Woodland Hills, California.
- Brost, Pete. 1989. Personal Communication. (Phone). Tahoe National Forest, Soda Springs, California. September 14, 1989.
- Buchanan, Bill. 1989. Personal Communication. (Phone). Oregon Department of Fish and Wildlife, Corvallis, Oregon. May 25, 1989.
- Bureau of Land Management. 1977. Scenic quality evaluation for the Klamath River Canyon. Medford District Office, Medford, Oregon.
- . 1979. Snake River birds of prey special research report. Boise District Office, Boise, Idaho.
- . 1980. Management framework plan for recreation. Medford District Office, Medford, Oregon.
- . 1981. Scenic quality field inventory for the North Klamath River. Redding District Office, Redding, California.
- . 1983. Medford grazing management program. Draft EIS. Medford District Office, Medford, Oregon.
- . 1983. Proposed livestock grazing management. Draft EIS. Redding District Office, Redding, California.
- . 1983. Recreation management plan for the Klamath River special recreation management area. Medford District Office, Medford, Oregon.
- . 1986. Visual resource inventory. BLM Manual Handbook 8410-1. Klamath Falls Resource Area Office, Klamath Falls, Oregon.
- . 1988. Area of Critical Environmental Concern Nomination of the Klamath Canyon. Evaluation by Medford District Office, Medford, Oregon.
- . 1988. Management plan for the Pokegama wild horse herd. Unpublished report on file. Klamath Falls Resource Area Office, Klamath Falls, Oregon.
- . 1988. Timber production capability classification. BLM Handbook 5251-1. Medford District Office, Medford, Oregon.
- . 1989. Letter from Lance Nimmo, Area Manager. Butte Falls Resource Area Office, Medford, Oregon. February 19, 1989.
- Center for Population Research and Census. 1989. *Official Population Estimates Oregon Cities and Counties*. Portland State University. Portland, Oregon.
- Chapman, Joseph A. and George A. Feldhamer. 1982. Wild mammals of North America. The John Hopkins University Press, Baltimore, Maryland.
- City of Klamath Falls. 1985. Application for license, Salt Cave hydroelectric project. Submitted to the Federal Energy Regulatory Commission. Vol. III, Exhibit E.
- . 1986. Application for license, Salt Caves hydroelectric project. Submitted to the Federal Energy Regulatory Commission. Vol. II, Exhibit E.
- . 1986. Confidential report on historic and archaeological resources. Submitted to the Federal Energy Regulatory Commission.
- . 1988. Analysis of the potential economic effects on the Klamath River whitewater rafting industry. A response to a FERC request for additional information.
- . 1988. Shortnose and Lost River sucker studies. A response to a FERC request for additional information.
- Coleman, Mark E., J. Kann, and G.G. Scoppettone. 1988. Life history and ecological investigations of catostomids from the upper Klamath Lake Basin, Oregon. Draft Annual Report. National Fisheries Research Center, USFWS, Seattle, Washington.
- Cross, Stephen P. 1977. A survey of bat populations and their habitat preferences in southern Oregon. Southern Oregon State College, Ashland, Oregon.

- Dicken, Samuel N. and Emily F. 1985. The legacy of ancient Lake Modoc: a historical geography of the Klamath Lakes Basin. Dicken, Eugene, Oregon.
- Doyle, Don. 1989. Personal Communication. (Phone). Deschutes National Forest, Bend, Oregon. September 14, 1989.
- Federal Energy Regulatory Commission. 1989. Draft environmental impact statement on the Salt Caves Hydroelectric project FERC (10199-000), Washington, D.C.
- Fortune, John. 1989. Personal Communication. (Phone). Oregon Department of Fish and Wildlife, Klamath Falls, Oregon. August 21, 1989.
- Franklin, Jerry F. and C.T. Dyrness. 1973. Natural vegetation of Oregon and Washington. USDA Forest Service General Technical Report PNW-8. Pacific Northwest Forest and Range Experiment Station.
- Griggs, Jim. 1989. Personal Communication. (Phone). Oregon Department of Fish and Wildlife, Portland, Oregon. June 16 and August 30, 1989.
- Hall, Roy V. Jr. 1985. Direct testimony before the Water Policy Review Board and the Energy Siting Council of the State of Oregon. Chairman, Shasta Nation. August 5, 1985.
- Heath, Mike. 1989. Personal Communication. (Phone). Plumas National Forest, LaPorte Ranger District, LaPorte, California. September 14, 1989.
- Ingles, Lloyd G. Mammals of the Pacific states. 1965. Stanford University Press, Stanford, California.
- Isaacs, Frank B. and Robert G. Anthony, 1988. Bald eagle nest locations and history of use in Oregon, 1971 through 1988. Oregon Cooperative Wildlife Research Unit, Oregon State University, Corvallis, Oregon.
- Jones, Joe Willie. 1989. Personal Communication. (Phone). Headwaters River Adventures, Ashland, Oregon. September 14, 1989.
- King, Ginger. 1989. Personal Communication. (Phone). Bureau of Land Management, Lakeview District Office, Lakeview, Oregon. September 14, 1989.
- Klamath County, Oregon. 1986. Klamath River Canyon park study.
- Klamath River Basin Compact Between the States of Oregon and California. 1957.
- Klamath Tribe. 1989. Upper Klamath Wild and Scenic River Study: Comments of the Klamath Tribe. (Letter). Lynn Schonchin Sr., Chairman, Klamath Tribe. December 26, 1989.
- Kroeber, Alfred L. 1925. Handbook of the Indians of California. Bureau of American Ethnology, Bulletin #78, Washington DC: Smithsonian Institute.
- Kuonen, Nell. 1989. Personal Communication. (Letter). Chairperson, Klamath River Basin Compact Commission, Klamath Falls, Oregon. July 10, 1989.
- LaLande, Jeffrey M. 1983. First over the Siskiyou: A commentary on Peter Skene Ogden's 1826-27 route of travel through northern California and southwest Oregon. In press.
- . 1989. A wilderness journey with Judge John B. Waldo, Oregon's first "Preservationist." Oregon Historical Quarterly 90(2):117-166.
- Littlefield, Carroll D. 1988. Status of the California yellow-billed cuckoo in Klamath County and eastern Oregon. Oregon Department of Fish and Wildlife, Nongame Wildlife Program Technical Report #89-5-01.
- Mack, Joanne M. 1983. Archaeological investigations in the Salt Caves locality: subsistence uniformity and cultural diversity on the Klamath River, Oregon. University of Oregon Anthropological Papers #29.
- . 1989. Upper Klamath River Canyon prehistory. Report submitted to BLM, Lakeview District Office, Lakeview, Oregon.
- MacWhorter, Rob. 1989. Personal Communication. (Phone). Mt. Hood National Forest, Gresham, Oregon. August 23, 1989.
- Maser, Chris and Stephen P. Cross. 1981. Notes on the distribution of Oregon bats. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Research Note PNW-379.

- Meyer, Gerry. 1989. Personal Communication. (Phone). BLM Baker District Office, Baker, Oregon. September 14, 1989.
- Monfore, John. 1989. Personal Communication. (Phone). Weyerhaeuser Co., Klamath Falls, Oregon. July 11, 1989.
- Munroe, Dean. 1989. Personal Communication. (Phone). Wilderness Adventures, Redding, California. June 6, 1989.
- North Coast Regional Water Quality Control Board. 1988. Water quality control plan for the North Coast Region. California State Water Resources Control Board, Santa Rosa, California.
- Northwest Power Planning Council. 1988. Protected Areas Amendments. Portland, Oregon.
- Opp, Ralph. 1989. Personal Communication. (Meeting). Oregon Department of Fish and Wildlife, Klamath Falls, Oregon. April 4, 1989.
- Oregon Department of Energy. 1986. Pacific Northwest rivers study; assessment guidelines: Oregon. Salem, Oregon.
- . 1986. Pacific Northwest rivers study, Oregon final summary report. Salem, Oregon.
- Oregon Department of Environmental Quality. 1988. A chance to comment on total maximum daily loads. Water Quality Division, Portland, Oregon.
- . 1989. Assessment of waterbody impairment by priority pollutants in the waters of the state of Oregon. Water Quality Division, Portland, Oregon.
- Oregon Department of Fish and Wildlife. 1985. Direct testimony before the Water Policy Review Board and the Energy Facility Siting Council of the State of Oregon. August 6, 1985.
- Oregon Department of Transportation, Parks and Recreation Division. 1985. Direct testimony before the Water Policy Review Board and the Energy Facility Siting Council of the State of Oregon. July 31, 1985.
- . 1987. Recreational values on Oregon Rivers.
- . 1988. Oregon's statewide comprehensive outdoor recreation plan, 1988-1993.
- Oregon Employment Division. *Oregon Resident Labor Force, Unemployment and Employment. Years 1984-88.* Salem, Oregon.
- Oregon Natural Heritage Data Base. 1989. Rare, threatened and endangered plants and animals of Oregon. Portland, Oregon.
- Oregon State University, Department of Forest Resources. 1990. Comparative analysis of whitewater boating resources in Oregon: Toward a regional model of river recreation. Final technical completion report, project number G1609-07, Water Resources Research Institute.
- Oregon State University, Extension Service. *Oregon County and State Agricultural Estimates. Special Report 790.* Years 1985-1989. Corvallis, Oregon.
- Oulman, Steve. 1990. Personal Communication (in person). Klamath County Planning Office. February 20, 1990.
- Pacific Coast American Peregrine Falcon Recovery Team. 1982. Pacific Coast recovery plan for the American peregrine falcon (*Falco peregrinus anatum*). The Fish and Wildlife Reference Service Unit 1, Denver, Colorado.
- Page, Joel. 1989. Personal Communication. (Phone). Klamath National Forest, Happy Camp, California. August 14, 1989.
- Perkins, J. Mark. 1986. Central Oregon survey for Townsend's big eared bat, *Plecotus townsendii*. Oregon Department of Fish and Wildlife contract #86-3-03.
- . 1987. Distribution, status, and habitat affinities of Townsend's big-eared bat (*Plecotus townsendii*) in Oregon. Oregon Department of Fish and Wildlife, Nongame Wildlife Program Technical Report #86-5-01.
- Phelps, Berry. 1989. Personal Communication. (Phone). BLM, Prineville District Office, Prineville, Oregon. September 14, 1989.
- Phinney, K. Harry and Chester A. Peek. 1960. Klamath Lake, an instance of natural enrichment. From the transactions of the seminar on algae and metropolitan wastes, April 27-29, 1960, U.S. Public Health Service, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

- Quinn, James W. and James M. Quinn. 1983. Handbook to the Klamath River Canyon.
- Randall, Warren R., Robert F. Keniston and Dale N. Bever. 1978. Manual of Oregon trees and shrubs. Oregon State University Book Stores, Inc. Corvallis, Oregon.
- Robin, Randy. 1990. Personal Communication. (Phone). California Employment Development Department. Labor Market Information Division.
- Roppe, Jerry. 1989. Personal Communication. (Phone). Pacific Power and Light Company, Portland, Oregon. July 11, 1989.
- Silver, Shirley. 1978. Shastan peoples. In Handbook of North American Indians, Volume 8, California. pp. 211-224. Robert F. Heizer (editor), Washington DC: Smithsonian Institute.
- Spier, Leslie. 1927. The Ghost Dance of 1870 among the Klamath of Oregon. University of Washington Publications in Anthropology. 2(2):39-56.
- . 1930. Klamath ethnology. University of California Publications in American Archaeology and Ethnology. 30:1-338. Berkeley, Calif: University of California Press.
- St. John, Alan D. 1987. The herpetology of the oak habitat of southwestern Klamath County, Oregon. Oregon Department of Fish and Wildlife, Nongame Wildlife Program Technical Report #87-3-01.
- Swisher, O.D. 1989. Personal communication. (Letter). Ashland, Oregon. August 16, 1989.
- Theodoratus, Dorothea J., Myreleen M. Ashman, Helen McCarthy, and Donna L. Genett. 1989. Klamath River Canyon ethnology study. Unpublished report on file Bureau of Land Management, Klamath Falls Resource Area Office, Klamath Falls, Oregon.
- Tomlins, Fred. 1989. Personal Communication. (Phone). Bureau of Land Management, Medford District Office, Medford, Oregon. April 27, 1989.
- United States Department of Commerce. 1988. *Local Area Personal Income 1981-86*. Vol. 5. Bureau of Economic Analysis. Washington, D.C.
- United States Fish and Wildlife Service. 1986. Recovery plan for the Pacific Bald Eagle. U.S. Fish and Wildlife Service, Portland, Oregon.
- . 1989. *Ceratomyxa shasta*, a Myxosporean parasite of salmonids. Fish disease leaflet 80. National Fisheries Research Center, Kearneysville, West Virginia.
- Ward, John. 1987. Economic assessment of the Klamath River as a wild & scenic river. in City of Klamath Falls. 1988. Analysis of the potential economic effects on the Klamath River whitewater rafting industry.
- Yreka Chamber of Commerce. March 1988. *Community Economic Profile for Yreka, Siskiyou County, California*.

Appendices



The canyon deepens through Hell's Corner in segment 2 constricting the river and providing nearly continuous Class IV - V rapids.

Appendix A

Recreation Opportunity Spectrum (ROS) Classes

The following chart describes each of the six ROS classes in terms of: (1) experience opportunities; (2) setting opportunities, and (3) activity opportunities. These descriptors provide a general overview of the opportunities included in each class. These overview statements do not describe each class in detail, but rather provide a point of departure from which the planner or manager can develop more precise prescriptions for each class based on specific situations encountered in field operations. The listing of activity opportunities is provided for illustrative purposes. It is not an all-inclusive list of activity opportunities on the public lands.

The Recreation Opportunity Spectrum Class Descriptions

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Primitive	<p>Opportunity for isolation from the sights and sounds of people, to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.</p>	<p>Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of induced restrictions and controls. Only facilities essential for resource protection are used. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts between groups. Motorized use within the area is not permitted.</p>	<p>Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl), ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (nonmotorized craft).</p>
Semi-Primitive Nonmotorized	<p>Some opportunity for isolation from the sights and sounds of people, but not as important as for primitive opportunities. Opportunity to have</p>	<p>Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low,</p>	<p>Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game,</p>

The Recreation Opportunity Spectrum Class Descriptions (continued)

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Semi-Primitive Nonmotorized (continued)	high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.	but there is often evidence of other area users. On-site controls and restrictions may be present, but are subtle. Facilities are provided for the protection of resource values and the safety of users only. Spacing of groups may be formalized to disperse use and limit contacts between groups. Motorized use is not permitted.	upland birds, waterfowl), ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft).
Semi-Primitive Motorized	Some opportunity for isolation from the sights and sounds of people, but not as important as for primitive opportunities. Opportunity to have high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other area users. On-site controls and restrictions may be present, but are subtle. Facilities are provided for the protection of resource values and safety of users only. Spacing of groups may be formalized to disperse use and limit contacts between groups. Motorized use is permitted.	Same as the above, plus the following: ORV Use (4-WD, dune buggy, dirt bike, snowmobile), power boating.
Roaded Natural	About equal opportunities for affiliation with other user groups and for isolation from sights and sounds of	Area is characterized by a generally natural environment with moderate evidence of the	All activities listed previously, plus the following: picnicking, rock collecting, wood

The Recreation Opportunity Spectrum (ROS) Classes (continued)

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Roaded Natural (continued)	man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important except in specific challenging activities. Practice of outdoor skills may be important. Opportunities for both motorized and non-motorized recreation are present.	sights and sounds of people. Resource modification and utilization practices are evident, but harmonize with the natural environment. Concentration of users is low to moderate with facilities sometimes provided for group activity. On-site controls and restrictions offer a sense of security. Rustic facilities are provided for user convenience as well as for safety and resource protection. Conventional motorized use is provided for in construction standards and design of facilities.	gathering, auto touring, downhill skiing, snowplay, ice skating, water-skiing and other water sports, hang gliding, interpretive use, rustic resorts and organized camps.
Rural	Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. These factors are generally more important than the natural setting. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant, except in those activities involving challenge and risk.	Area is characterized by substantially modified natural environment. Resource modification and utilization practices are obvious. Sights and sounds of people are readily evident, and the concentration of users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for specific activities. Developed sites, roads	All activities listed previously, plus the following: competitive games, spectator sports, bicycling, jogging, outdoor concerts, and modern resorts.

The Recreation Opportunity Spectrum (ROS) Classes (continued)

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Rural (continued)		and trails, are designed for moderate to high use. Moderate densities are provided far away from developed sites. Facilities for intensive motorized use are available.	
Modern Urban	Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. Experiencing the natural environment and the use of outdoor skills are largely unimportant.	Area is characterized by a highly modified environment, although the background may have natural elements. Vegetation is often exotic and manicured. Soil may be protected by surfacing. Sights and sounds of people, on-site, predominate. Large numbers of users can be expected. Modern facilities are provided for the use and convenience of large numbers of people. Controls and restrictions are obvious and numerous. Facilities for high intensity motor use and parking are present with forms of mass transit often available.	All activities listed previously.

Appendix B

Species List For Birds, Mammals, and Herptiles¹

Birds Known To Occur Within The Study Area

Common Name	Scientific Name
RAPTORS	
Turkey Vulture	<i>Carthartes aura</i>
Sharp-shinned Hawk	<i>Accipter striatus</i>
Cooper's Hawk	<i>Accipter cooperii</i>
Northern Goshawk	<i>Accipter gentilis</i>
Osprey	<i>Pandion haliaetus</i>
Bald Eagle	<i>Haliaetus leucocephalus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Red-tailed Hawk	<i>Bueto jamaicensis</i>
American Kestrel	<i>Falco sparverius</i>
Prairie Falcon	<i>Falco mexicanus</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Long-eared Owl	<i>Asio otus</i>
Great Horned Owl	<i>Bubo virginianus</i>
Western Screech-Owl	<i>Otus kennicottii</i>
Flammulated Owl	<i>Otus flammeolus</i>
Northern Pygmy Owl	<i>Glaucidium gnoma</i>
WATERFOWL	
Tundra Swan	<i>Cygnus columbianus</i>
Canada Goose	<i>Branta canadensis</i>
Common Merganser	<i>Mergus merganser</i>
Barrow's Goldeneye	<i>Bucephala islandica</i>
Wood Duck	<i>Aix sponsa</i>
Green-wing Teal	<i>Anas crecca</i>
Cinnamon Teal	<i>Anas cyanoptera</i>
Mallard	<i>Anas platyrhynchos</i>
UPLAND GAMEBIRDS	
Blue Grouse	<i>Dendragapus obscurus</i>
California Quail	<i>Callipepla californica</i>
Mountain Quail	<i>Oreortyx pictus</i>
Chukar	<i>Alectoris chukar</i>
Red-legged Partridge	<i>Alectoris rufa</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Band-tailed Pigeon	<i>Columba fasciata</i>
Mourning Dove	<i>Zenaida macroura</i>

Common Name**Scientific Name****WATER ASSOCIATED BIRDS**

Double-crested Cormorant
Great Blue Heron
Spotted Sandpiper
Killdeer
Ring-billed Gull
California Gull
Forster's Tern
Belted Kingfisher
American Dipper

Phalacrocorax auritus
Ardea herodias
Actitis macularia
Charadrius vociferus
Larus delawarensis
Larus californicus
Sterna forsteri
Ceryle alcyon
Cinclus mexicanus

NON-GAME BIRDS

Vaux's Swift
Common Nighthawk
White-throated Swift
Northern Flicker
Acorn Woodpecker
Lewis' Woodpecker
Downy Woodpecker
Hairy Woodpecker
Pileated Woodpecker
Yellow-bellied Sapsucker
Western Flycatcher
Ash-throated Flycatcher
Say's Phoebe
Olive-sided Flycatcher
Empidonax Sp.
Violet-green Swallow
Tree Swallow
Bank Swallow
Cliff Swallow
Scrub Jay
Stellar's Jay
Common Raven
American Crow
Wrentit
Black-capped Chickadee
Mountain Chickadee
Brown Creeper
Red-breasted Nuthatch
House Wren
Canyon Wren
Bewick's Wren
Kinglet Sp.
Mountain Bluebird
Western Bluebird
Townsend's Solitaire
Thrush Sp.
American Robin
European Starling
Warbling Vireo
Orange-crowned Warbler

Chaetura vauxi
Chordeiles minor
Aeronautes saxatalis
Colaptes auratus
Melanerpes formicivorus
Melanerpes lewis
Picoides pubescens
Picoides villosus
Dryocopus pileatus
Sphyrapicus varius
Empidonax difficilis
Myiarchus cinerascens
Sayornis saya
Contopus borealis
Empidonax sp.
Tachycineta thalassina
Tachycineta bicolor
Riparia riparia
Hirundo pyrrhonota
Aphelocoma coerulescens
Cyanocitta stelleri
Corvus corax
Corvus brachyrhynchos
Chamaea fasciata
Parus atricapillus
Parus gambeli
Certhia americana
Sitta canadensis
Troglodytes aedon
Catherpes mexicanus
Thyroanthes bewickii
Regulus sp.
Sialia currucoides
Sialia mexicana
Myadestes townsendi
Catharus sp.
Turdus migratorius
Sturnis vulgaris
Vireo gilvus
Vermivora celata

Common Name**Scientific Name****NON-GAME BIRDS (continued)**

Yellow-rumped Warbler	<i>Dendroica coronata</i>
Yellow Warbler	<i>Dendroica petechia</i>
MacGillivray's Warbler	<i>Oporornis tolmiei</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Lazuli Bunting	<i>Passerina amoena</i>
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>
Song Sparrow	<i>Melospiza melodia</i>
Chipping Sparrow	<i>Spizella passerina</i>
Brewer's Sparrow	<i>Spizella breweri</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Northern Oriole	<i>Icterus galbula</i>
Western Tanager	<i>Piranga ludoviciana</i>
Purple Finch	<i>Carpodacus purpureus</i>

Mammals Known To Occur Within The Study Area**OTHER MAMMALS**

Porcupine	<i>Erithizon dorsatum</i>
Striped Skunk	<i>Mephitis mephitis</i>
Western Spotted Skunk	<i>Spilogale gracilis</i>
Nuttall's Cottontail	<i>Sylvilagus audubonii</i>
Western Gray Squirrel	<i>Sciurus griseus</i>
California Ground Squirrel	<i>Spermophilus beechyii</i>
Yellow Pine Chipmunk	<i>Eutamias amoenus</i>
Bushy-tailed Woodrat	<i>Neotoma cinerea</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Trowbridge's Shrew	<i>Sorex trowbridgii</i>
Townsend's Big-eared Bat	<i>Plecotus townsendii</i>
Little Brown Bat	<i>Myotis lucifugus</i>
California Myotis	<i>Myotis californicus</i>
Yuma Myotis	<i>Myotis yumanensis</i>
Hoary Bat	<i>Lasiurus cinereus</i>

FURBEARERS

Bobcat	<i>Felis rufus</i>
Coyote	<i>Canis latrans</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Raccoon	<i>Procyon lotor</i>
Ringtail	<i>Bassariscus astutus</i>
River Otter	<i>Lutra canadensis</i>
Beaver	<i>Castor canadensis</i>
Muskrat	<i>Ondatra zibethicus</i>
Mink	<i>Mustela vison</i>
Fisher	<i>Martes pennanti</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Short-tailed Weasel	<i>Mustela erminea</i>

Common Name**Scientific Name**

BIG GAME

Roosevelt Elk
Black-tailed Deer
Black Bear
Cougar

Cervus elaphus roosevelti
Odocoileus hemionus
Ursus americanus
Felis concolor

Herptiles Known To Occur Within The Study Area**REPTILES**

Western Rattlesnake
Ringneck Snake
Common Garter Snake
Western Terrestrial Garter Snake
Gopher Snake
Racer
California Mountain Kingsnake
Western Fence Lizard
Alligator Lizard
Sagebrush Lizard
Western Skink
Western Pond Turtle

Crotalus viridus
Diadophis punctatus
Thamnophis sirtalis
Thamnophis elegans
Pituophis melanoleucus
Coluber constrictor
Lampropeltis zonata
Sceloporus occidentalis
Gerrhonotus sp.
Sceloporus graciosus
Eumeces skiltonianus
Clemmys marmorata

AMPHIBIANS

Western Toad
Pacific Tree Frog
Long-toed Salamander

Bufo boreas
Hyla regilla
Ambystoma macrodactylum

¹Sources: City of Klamath Falls 1986; Oregon Department of Fish and Wildlife, Klamath District Office; St. John 1987; BLM, Klamath Falls Resource Area, field observations.

Appendix C

Species List for Fish¹

Fish Species Found In The Klamath River Within The Study Area

Common Name	Scientific Name
Brown Trout	<i>Salmo trutta</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>
Lost River Sucker	<i>Deltistes luxatus</i>
Shortnose Sucker	<i>Chasmistes brevirostris</i>
Klamath Largescale Sucker	<i>Catostomus snyderi</i>
Klamath Smallscale Sucker	<i>Catostomus rimiculus</i>
Blue Chub	<i>Gila coerulea</i>
Tui Chub	<i>Gila bicolor</i>
Marbled Sculpin	<i>Cottus klamathensis</i>
Pacific Lamprey	<i>Lampetra tridentatas</i>
Yellow Perch	<i>Perca flavescens</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Brown Bullhead	<i>Ictalurus nebulosus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Klamath Speckled Dace	<i>Rhinichthys osculus</i>

¹Sources: City of Klamath Falls 1986; Oregon Department of Fish and Wildlife, Klamath District Office; California Department of Fish and Game, Yreka Field Office.

Appendix D

Prehistoric Sites in the Upper Klamath River Study Area

Site Number	Site Type	Comments	Ownership
35 KL 16	Pit House Village	23 housepits	Private
35 KL 18	Pit House Village	41 housepits	Private
35 KL 20	Pit House Village	13 housepits	Private
35 KL 22	Pit House Village	7 housepits, burial	BLM
35 KL 23	Pit House Village	4 housepits	Private
35 KL 25	Pit House Village	10 housepits	Private
35 KL 26	Pit House Village	10 housepits	Private
35 KL 550	Pit House Village	3 housepits	BLM
35 KL 576	Pit House Village	4 housepits	BLM
35 KL 628	Pit House Village	2 housepits	BLM
35 KL 629	Pit House Village	3 housepits, burial	BLM
35 KL 631	Pit House Village	8 housepits	Private
35 KL 633	Pit House Village	8 housepits	BLM
CA SIS 1198	Pit House Village	10 housepits, Ghost Dance	BLM
BLM 030-060	Pit House Village	4 housepits	BLM
35 KL 785	Stone Ring	1 stone ring	BLM
35 KL 797	Stone Rings	5 stone rings	BLM
CA SIS 16	Rock Shelter	midden deposit	Private
35 KL 19	Lithic Scatter		Private
35 KL 551	Lithic Scatter		BLM
35 KL 552	Lithic Scatter		Private
35 KL 554	Lithic Scatter		Private
35 KL 555	Lithic Scatter		BLM
35 KL 556	Lithic Scatter		BLM
35 KL 557	Lithic Scatter		Private
35 KL 558	Lithic Scatter	sparse flakes	BLM
35 KL 566	Lithic Scatter		Private
35 KL 578	Lithic Scatter		Private
35 KL 632	Lithic Scatter	very diffuse	BLM
35 KL 634	Lithic Scatter	sparse flakes	BLM
35 KL 635	Lithic Scatter		BLM
35 KL 783	Lithic Scatter		BLM
35 KL 784	Lithic Scatter	sparse flakes	Private
35 KL 786	Lithic Scatter		BLM
35 KL 787	Lithic Scatter		Private
35 KL 788	Lithic Scatter		Private
35 KL 789	Lithic Scatter		BLM
35 KL 790	Lithic Scatter		Private
Forebay Site	Lithic Scatter		Private
BLM 030-061	Midden		Private
35 KL 21	Burials and midden		Private
35 KL 567	Burial site	27 rock cairns	Private
Site 44	Burial site	33 rock cairns	Private
35 KL 630	Quarry	chert outcrop	BLM

Appendix E

Species List for Plants¹

Some Common Plant Species Occurring In The Study Area

Common Name

Scientific Name

TREES

Sugar Pine	<i>Pinus lambertiana</i>
Ponderosa Pine	<i>Pinus ponderosa</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
White Fir	<i>Abies concolor</i>
Incense Cedar	<i>Libocedrus decurrens</i>
Western Juniper	<i>Juniperus occidentalis</i>
Golden Chinquapin	<i>Castanopsis chrysophylla</i>
Oregon White Oak	<i>Quercus garryana</i>
California Black Oak	<i>Quercus kelloggii</i>
Birch	<i>Betula</i> sp.
Oregon Ash	<i>Fraxinus latifolia</i>
Quaking Aspen	<i>Populus tremuloides</i>
White Alder	<i>Alnus rhombifolia</i>

SHRUBS

Mountain Mahogany	<i>Cercocarpus</i> sp.
Manzanita	<i>Arctostaphylos</i> sp.
Deerbrush	<i>Ceanothus integerrimus</i>
Wedgeleaf Ceanothus	<i>Ceanothus cuneatus</i>
Bitterbrush	<i>Purshia tridentata</i>
Rabbitbrush	<i>Chrysothamnus</i> sp.
Western Serviceberry	<i>Amelanchier florida</i>
Gooseberry	<i>Ribes</i> sp.
Snowberry	<i>Symphoricarpos</i> sp.
Oregon Grape	<i>Berberis aquifolium</i>
Poison Oak	<i>Rhus diversiloba</i>
Blue Elderberry	<i>Sambucus cerulea</i>
Lewis Mockorange	<i>Philadelphus lewisii</i>
Willow	<i>Salix</i> sp.
Douglas Spiraea	<i>Spiraea douglasii</i>
Western Wild Grape	<i>Vitis californica</i>

FORBS

Buckwheat	<i>Eriogonum</i> sp.
Western Buttercup	<i>Ranunculus occidentalis</i>
Pussytoes	<i>Antennaria</i> sp.
Nuttall's Gayophytum	<i>Gayophytum nuttallii</i>
Puget Balsamroot	<i>Balsamorhiza deltoidea</i>
Wild Strawberry	<i>Fragaria</i> sp.
Lupine	<i>Lupinus</i> sp.
Mountain Dandelion	<i>Agnoseris</i> sp.
Yarrow	<i>Achillea millefolium</i>
Solomonplume	<i>Smilacina</i> sp.
Large-flowered Collomia	<i>Collomia grandiflora</i>

Some Common Plant Species Occurring In The Study Area (continued)

Common Name

Scientific Name

FORBS (continued)

Wooly Sunflower	<i>Eriophyllum lanatum</i>
Tarweed	<i>Madia</i> sp.
California Poppy	<i>Eschscholtzia californica</i>
Least Hopclover	<i>Trifolium dubium</i>
Tidy-tips	<i>Layia glandulosa</i>
Watercress	<i>Rorippa nasturtium-aquaticum</i>
Monkey-flower	<i>Mimulus</i> sp.
Speedwell	<i>Veronica</i> sp.
Boreal Bog-orchid	<i>Habenaria dilatata</i>
Cat-tail	<i>Typha latifolia</i>

GRASSES

Two-flowered Fescue	<i>Festuca reflexa</i>
Western Fescue	<i>Festuca occidentalis</i>
Idaho Fescue	<i>Festuca idahoensis</i>
Blue Wildrye	<i>Elymus glaucus</i>
Medusahead Wildrye	<i>Elymus caput-medusae</i>
Cheatgrass	<i>Bromus tectorum</i>
Hairy Brome	<i>Bromus commutatus</i>
Soft Cheat	<i>Bromus mollis</i>
Needlegrass	<i>Stipa</i> sp.
Pine Bluegrass	<i>Poa scabrella</i>
Bulbous Bluegrass	<i>Poa bulbosa</i>
Bluebunch Wheatgrass	<i>Agropyron spicatum</i>
Bottlebrush Squirreltail	<i>Sitanion hystrix</i>
Foxtail Barley	<i>Hordeum</i> sp.
Few-flowered Wild Oatgrass	<i>Danthonia unispicata</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Rush	<i>Juncus</i> sp.
Sedge	<i>Carex</i> sp.

T&E Plant Species Potentially Found In Study Area

Pygmy Monkey-flower	<i>Mimulus pygmaeus</i>
Greene's Mariposa Lily	<i>Calochortus greenei</i>
Short-podded Thelypody	<i>Thelypodium brachycarpum</i>

¹Source: City of Klamath Falls 1986.

Appendix F

Statewide Comprehensive Outdoor Recreation Plan

Region 9

The region used in this document for a comparison of outstandingly remarkable values is the Southwestern Region 9 from the Statewide Comprehensive Outdoor Recreation Plan, described below and shown on Map 1. Siskiyou County in California (not shown) is also included in the region for purposes of comparing values in segment 3 of the upper Klamath River.

Southwestern—Region 9

Counties: Jackson, Josephine, Klamath and most of Douglas County.

This region is very mountainous. One of the state's most outstanding natural features, Crater Lake, is located in the southern Cascades in this area. The lake lies 2,000 feet below the rim of the surrounding caldera which was created by the prehistoric explosion of the volcano, Mt. Mazama. Southwest of the Cascade Range are the Siskiyou Mountains. These peaks, some more than 8,000 feet, are much higher than those in the Coast Range (which form the western boundary of this region).

The Umpqua River cuts east/west across the northern area of this region. The Rogue River and its tributaries, primarily the Applegate and Illinois Rivers, drain the Siskiyou watershed and flow through the mountains in deep gorges. The larger lowlands of this area are the alluvial basins around Medford and Grants Pass and the wetlands of the Klamath Lake area.

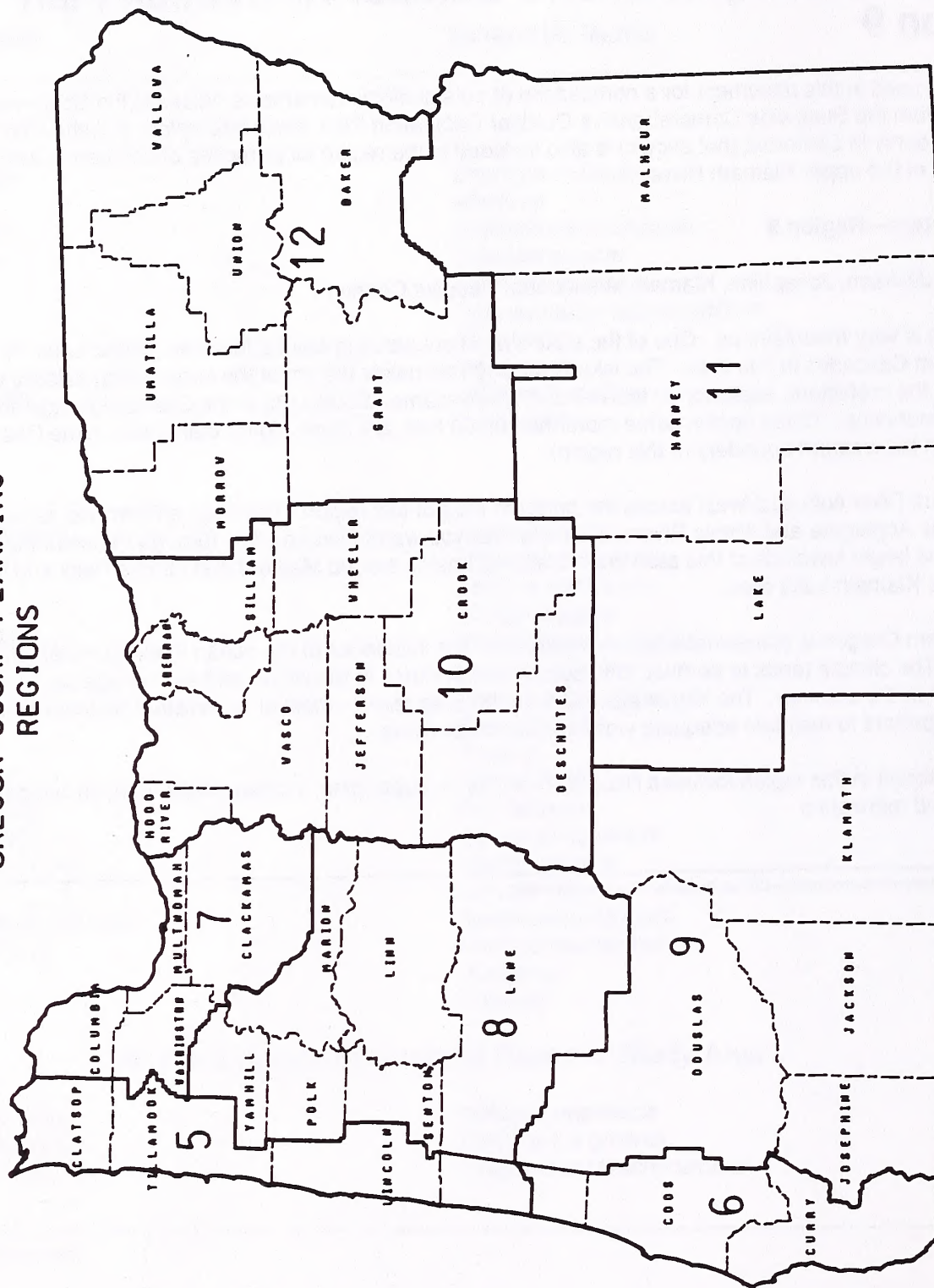
Southwestern Oregon is somewhat more sheltered from the influences of the ocean than the Willamette Valley to the north. The climate tends to be drier, with colder temperatures in the winter and an average daytime temperature of 85°F in the summer. The higher elevations of the area receive most of its moisture as snow in the winter which is important to maintain adequate water for the major rivers.

The mixed forest in this region includes Douglas fir, white fir, sugar pine, incense cedar, canyon live oak, tan oak, madrone and manzanita

Source: Oregon's Statewide Comprehensive Outdoor Recreation Plan, December 1988.

MAP 1

OREGON SCORP PLANNING
REGIONS



Appendix G

Public Involvement

Introduction

In October 1988, the Oregon Omnibus Wild and Scenic Rivers Act was passed, directing the Bureau of Land Management to complete a study of the eligibility and suitability of the upper Klamath River for potential addition to the National Wild and Scenic Rivers System (NWSRS).

Consultation, coordination, and public involvement have occurred throughout the upper Klamath River study process. This was achieved through public meetings in Klamath Falls, Oregon and Copco, California; informal meetings with various interest groups and local, State, and other Federal agencies; workshops with local, State, and Federal agency representatives; and meetings with the BLM Lakeview District Multiple Use Advisory Council.

Scoping Phase

An open house was held in February 1989 in Klamath Falls, Oregon to solicit public comments on the river study, to discuss and define river issues and criteria, and to explain the study process. This was followed by a 45-day comment period in which both formal (written) and informal (verbal) comments were considered. A public meeting, held in July 1989 in Copco, California, and associated 21-day comment period addressed the inclusion of the California segment of the upper Klamath River to the BLM's study process. Twenty people signed in at the February open house and 37 signed in at the Copco meeting. The BLM received a total of 111 written comments during these comment periods.

During formulation of the draft river study, (between February and October 1989), the BLM met with several organizations, agencies, and individuals who provided additional data, input on process, and accuracy checks. BLM representatives also attended several workshops with local, State, and other Federal agencies, predominantly to discuss specific steps in the study process and to further interagency coordination.

Draft River Study

The Draft Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study was published and mailed in November 1989 to over 700 individuals, agencies, organizations, the media, and selected schools and libraries, followed by a 60-day comment period that ended December 31, 1989. The BLM received 1,057 responses on the draft study report; in addition, a copy of a petition and copies of several letters already submitted to the BLM during the February and July comment periods were received. Almost 60 of the responses were received after the official comment period ended. The late comments were logged in and read, but because of time restraints, the river study team could not give these responses as much attention as they did those responses that were submitted on time. The responses received on time were analyzed and carefully considered for the final study report.

During the comment period on the draft river study, two public meetings were held in Klamath Falls—an informal open house on December 6 and a structured BLM Lakeview District Multiple Use Advisory Council meeting on December 7 that included 15-minute oral presentations from 10 agencies and 5-minute presentations from 27 members of the public. Thirty people signed in during the open house and 44 signed in during the Multiple Use Advisory Council meeting; however, there were several more attendees at the Council meeting who did not sign in.

Comment Analysis

Fifty-eight percent of the 1,057 responses were from Oregon, 40 percent from California, and two percent from other states. Approximately 90 percent of the responses were considered to be expressions of personal preference or opinions for or against Federal designation. The remainder of the responses contained substantive

comments—that is, those that addressed the adequacy and accuracy of the study, provided additional information, or asked for clarification. A list of the respondents is included in chapter 6 and a summary of key applicable comments, grouped by chapter, is included in this appendix. Many of the comments that either provided factual corrections or additional information or requested clarification are incorporated in the final study report and are not documented separately in this appendix. All of the responses are available for public review in the Klamath Falls Resource Area office. Copies of the responses are available for Congressional review.

Table G-1 is a summary of the respondents' identified or apparent affiliations. Some individuals wrote more than once—these were counted as only one response—and some letters were signed by more than one individual or represented the position of more than one organization—these were counted as one response with the appropriate number of signatures. Most of the responses came from Oregon and California. The remainder of responses came from Washington state (8); Arizona (3); Minnesota (2); Washington, DC (2); and Colorado, Idaho, Maine, Massachusetts, Nevada, New York, and Texas with one each.

Table G-1. Respondent Affiliation

Location	#	Individual	Gov't Agency/ Representative	Business	Organization
Oregon	617	546	28	29	14
(Klamath Falls)	(441)	(405)	(5)	(26)	(5)
California	418	383	2	21	12
Other	22	20	1	0	1

While not addressing the adequacy of the draft study, many respondents expressed their personal preferences or opinions concerning the potential addition of the upper Klamath River to the NWSRS. The majority of opinions *against* designation came from Klamath Falls and *for* designation from California and the other states. In Oregon, outside of Klamath Falls, the opinions were fairly evenly divided, but were slightly more in favor of Federal designation. Twenty-four percent (255) of the total responses received were form letters, which appear to be the result of mail-in campaigns inspired by proponents of the proposed Salt Caves hydroelectric project and by conservation groups. Responses from Klamath Falls (441) included 193 form letters, including 140 pre-stamped postcards (reprinted below). All but two of the 193 form letters were against designation.

TO: Bureau of Land Management
FROM: Concerned Residents of Klamath County
RE: The future of Klamath Falls

We are strongly opposed to the federal designation of the Klamath River as Wild and Scenic.

Wild and Scenic designation is not in our region's best interest. Designation calls for freezing our river's resources, meaning an end to economic development projects designed to create jobs, ease our tax burden, and brighten our economic future. Please consider our future.

Sincerely,

ADDRESS

CITY STATE ZIP

Table G-2 is a summary of the form of each response on the draft study report received during the comment period.

Table G-2. Form of Response

Location	Letter	Postcard	Memo	Testimony	Form Letter	Resolution
Oregon	382	7	3	6	216	3
(Klamath Falls)	(239)	(2)	(1)	(6)	(193)	(0)
California	343	35	1	0	39	0
Other	20	2	0	0	0	0

Summary of Key Comments

Following the public comment period on the draft study report, analysis of written responses and oral testimony showed that approximately 10 percent of the responses contained substantive comments. The BLM sorted the substantive comments by subject, combined all the similar comments into a summary comment, and grouped the summary comments by the chapter in which the comment best applies. Text revisions were often considered to be the appropriate response; this is noted where appropriate. Some comments dealing with issues beyond the scope of this study are included, with responses intended to clarify the policies or processes followed in the study report. Differences between the draft and final study report are indicated in the following comment/response section; comments were grouped by chapter to aid the readers who are interested in those differences. Because there is so much controversy surrounding this study and its conclusions, several of the issues and concerns are not clear-cut. For this reason, where possible, the differing opinions are listed together to show the reader the diversity of impressions on an issue.

Chapter 1

Study Segments and Boundary

Comment: The dividing line between segments 1 and 2 should be relocated to fall immediately below the J.C. Boyle Powerhouse to reflect eligibility findings and to match the State Scenic Waterway boundary.

Response: This change has been made. The amended river segment boundaries are described in chapter 1 in the Study Segments and Boundary section.

Comment: Given the present potential for hydroelectric development on the river, a reasonable alternative river segment for BLM analysis would appear to be the segment extending downstream from the proposed Salt Caves Powerhouse.

Response: Congress directed the BLM to conduct an eligibility and suitability study of the upper Klamath River from the J.C. Boyle Dam to the Oregon-California state line focusing on its natural values. The Wild and Scenic Rivers Act directs the resource values to be studied as they exist *at the time of the study*. Segmentation based on potential projects in the study area is not the intent of the Act or of Congress; therefore, it is beyond the scope of this study.

Klamath River Basin Compact

Comment: The river study report should discuss the history of the Klamath River Basin Compact over the past century.

Response: A brief history of the Compact was added to Chapter 1 in the Klamath River Basin Compact section.

Oregon Scenic Waterways Act

Comment: The draft study report repeatedly points to Ballot Measure 7 and says Wild and Scenic designation would be consistent with it, but it does not say how it failed in Klamath County.

Comment: The voters in Oregon have designated the upper Klamath River, from the J.C. Boyle Powerhouse to the Oregon-California state line, as an Oregon Scenic Waterway. Clearly this indicates this is a river worthy of protection.

Response: The statement that Ballot Measure 7 passed in Oregon, but not in Klamath County, was added to chapter 1 in the Oregon Scenic Waterways Act section.

County Comprehensive Planning

Comment: Several elements and policies applicable to the Klamath River Canyon were left out of the discussion on the Klamath County Comprehensive Plan.

Response: The appropriate elements (statewide goals) and three county policies that are directly relevant to the Klamath River Canyon were added to chapter 1 in the County Comprehensive Planning section.

Chapter 2

Socioeconomics

Comment: The draft study report did not consider the regional economy.

Comment: The final study report should include an economic analysis of present resource values for comparison with potential economic benefits from the proposed Salt Caves hydroelectric project.

Comment: Recreational economics should be more thoroughly evaluated.

Response: There is no detailed economic analysis because, between present management and anticipated management under designation, there would be little, if any, notable economic effect or difference. Probable economic effects from the proposed Salt Caves hydroelectric project, which would be precluded by designation, are considered in the Federal Energy Regulatory Commission's EIS on the proposed hydroelectric project. As a courtesy to readers of this study, additional economic information (with no analysis) is provided in the Socioeconomics section in chapter 2 and a summary of existing economic studies (with no analysis or interpretation) is provided in appendix I.

Timber Management

Comment: The final study report could be strengthened by providing information about the private commercial forest land in or adjoining the study area.

Response: As stated in chapter 2, the major private landowner in the eligible river segments has indicated that little commercial timber exists. Public or private commercial forest land acres outside of, but adjoining, the study area are beyond the scope of this study.

Comment: The draft study report identifies 1,810 acres of commercial forest on public land in the study area (segments 1 and 2). From the scattered distribution of these forest land types, it appears that productivity and economic values could be relatively low.

Comment: Permanently locking up the 1,810 acres of Federal timber in the Klamath Canyon would impact the timber industry.

Response: The figure of 1,810 acres of commercial forest land was incorrectly used in the draft study report. Based on the current classification in the Jackson-Klamath Management Framework Plan, there less than 200 acres of BLM commercial forest lands in the canyon. This change is reflected in the Timber section in chapter 2. The 1,810 acre figure came from a new timber production classification system that will be evaluated in the Klamath Falls Resource Management Plan/Environmental Impact Statement for the 1990's. The draft RMP/EIS is anticipated to be released in the fall of 1991. In the resulting record of decision for the final RMP/EIS, these timber lands may either remain in the timber production base or be removed from the base because they are uneconomical/unfeasible for harvest or because their management or harvest could conflict with other resource values.

Comment: The possible added cost of overall fire management is not addressed.

Response: An increase in recreational use of the river is likely to occur regardless of Congress' decision. Human-caused fire risk could increase in conjunction with an increase in recreational use; therefore, increased fire suppression costs are not anticipated to be a result of designation, but will be addressed in a river management plan.

Native American Traditional Use

Comment: The draft study report did not adequately discuss Native American concerns about the canyon.

Comment: The draft study did not describe the cultural importance of the canyon to members of the Shasta Nation.

Response: The Native American Traditional Use section in chapter 2 now includes more detail on the spiritual use and cultural importance of the canyon. Based on the additional information provided during the comment period, the BLM determined that Native American Traditional Use of the canyon is an outstandingly remarkable value.

Recreation

Comment: The term "region" used in the Recreation section of the draft study report is confusing.

Response: The region discussed for recreation in the study report is now more clearly defined. This clarification is in the Recreation section in chapter 2 and in the Outstandingly Remarkable Values section in chapter 3.

Comment: The draft study report implies that the river is unrunnable when the J.C. Boyle Powerhouse is not in operation. The segment between the J.C. Boyle Powerhouse and the Frain Ranch can be run with kayaks and canoes when the powerhouse is not in operation.

Response: This change was made in the Recreation section in chapter 2.

Comment: Installation of new butterfly valves by Pacific Power and Light Company at the J.C. Boyle Power plant should eliminate the three-week shutdown of the plant each summer and increase the number of visitor use days.

Response: The Pacific Power and Light Company has indicated that installation of butterfly valves might reduce, but not necessarily eliminate, the annual shutdown of the powerhouse. Because the number of additional user days may not subsequently increase, the final study report was not modified to reflect this potential change. If an increase in visitor use days does result from a reduction in the annual shutdown time of the powerhouse, this change will be reflected in the management plan.

Comment: The number of rafting user days in the draft study report is greatly underestimated. The BLM has not obtained accurate data and should take another look at these figures for the final study report.

Response: As stated in final table 2-6 (draft table 2-7) visitor use figures are lower than actual use on the river because a self-registration system is used and the table does not reflect those who do not register. Better user figures, as they become available, will be re-addressed in a future river management plan.

Water

Comment: The State of Oregon provided corrections in wording for the Water section, specifically under Beneficial Uses and Water Quality.

Response: The Water section in chapter 2 now reflects these corrections.

Chapter 3

Free-Flowing

Comment: Segment 1 is not free-flowing in the sense the Wild and Scenic Rivers Act defines and, in addition, the biological and scenic values have been severely compromised by the diversion and associated activities. The net effect is that this river segment has been reduced beyond the level that the Act means to protect.

Comment: The Oregon Rivers Council agrees with the BLM's determination of free-flowing.

Comment: The State of Oregon disagrees with BLM's application of "free-flowing" criterion for the lower 2.8 miles of segment 1 (RM 222.6 to 219.8). Their justification is as follows:

1. "Without impoundment, diversion..." The BLM has inappropriately determined that this segment has an impoundment or diversion within it. The actual diversion is outside of the study area and segment 1 boundary. It is located at the top of the J.C. Boyle Dam. The facts in the study do not suggest otherwise. That is page 1-2 (Upper Klamath, Oregon) uses the term "below" the J.C. Boyle Dam; and page 1-5 (study segments) uses the term "from" the dam.

It is inferred that the dam is not included and that segment 1 starts at a point below the dam structure. Segment 1 has a controlled flow, albeit to no less degree than segments 2 and 3. Section 16(b) of the Wild and Scenic Rivers Act acknowledges the presence of impoundments above and below a given study river segment as not precluding eligibility. The river should be evaluated "as is" at the time of the study. In that instance, segment 1 should be considered as natural a flow as any other controlled river in the Wild and Scenic River System.

2. "Straightening, Modification..." Portions of segment 1 have been significantly altered by riprap and bank modification, but only from J.C. Boyle Dam downstream to a point where the diversion flume leaves the river by tunnel (Approximately RM 221). From that point on downstream to segment 2 there are no significant modifications to the bank or river.

Based on this analysis we conclude that segment 1 from approximately RM 221 downstream to segment 2 is indeed eligible having met both tests of the "free-flowing" criterion.

Of particular importance is the finding that the lower 0.8 miles from John Boyle Powerhouse to the stream gauge is ineligible. This is also a State Scenic Waterway segment. It would be grossly inconsistent for the report to conclude this segment is not eligible when it displays many if not all of the characteristics of segments 2 and 3.

Response: The BLM river study team re-examined the definition of free-flowing in the Wild and Scenic Rivers Act. After consultation with other specialists from BLM and other Federal agencies, the study team determined their initial conclusion was correct that segment 1 is not free-flowing.

Eligibility

Comment: A determination of ineligibility for the lower 0.8 mile of segment 1 (below the J.C. Boyle Powerhouse) is inconsistent with the State Scenic Waterway status which includes this portion of the river.

Response: The conclusion in the draft river study was that the lower 0.8 mile of segment 1 was eligible for inclusion in the National Wild and Scenic Rivers System, but this was not clear to most readers. As noted in the first comment and response under chapter 1, the dividing line between segment 1 and 2 was moved up 0.8 mile to the J.C. Boyle Powerhouse. Therefore, all of segment 1 is ineligible and all of segment 2 is eligible for inclusion in the NWSRS. This is further described in the Study Segments and Boundary section in chapter 1 and the Free-Flowing section in chapter 3.

Comment: It is unclear whether licensing of the proposed Salt Caves hydroelectric project would affect the eligibility status of the upper Klamath River for inclusion in the National Wild and Scenic Rivers System.

Response: This question is beyond the scope of the study. The BLM study report only addresses whether the upper Klamath River is eligible and suitable for designation in its existing state at the time of the study.

Outstandingly Remarkable Values-Recreation Resources

Comment: Recreational use on the upper Klamath should be compared with other rivers in the region.

Response: Comparisons of recreational uses between rivers within the region could be useful if accurate visitor use numbers were available and if they were a significant determining factor for assessing the outstandingly remarkable recreational values on the upper Klamath River. In the case of the upper Klamath, the outstandingly remarkable recreational values are dependent upon natural resource attributes and the existence of rare or exemplary recreational experience opportunities rather than demand for use of resources and opportunities that exist elsewhere in the region. Eligibility criteria, as developed and used by the BLM in Instruction Memorandum OR-89-632, is described in the Outstandingly Remarkable Values section in chapter 3.

Comment: Nine of the fifteen most popular recreational guidebooks concerning the Pacific Coast states did not mention the upper Klamath River. Clearly, this indicates a lack of regional and outstanding significance.

Response: Recent improvements in the whitewater raft technology, including self-bailing capabilities, allow previously unrunnable rivers to be accessible for recreational use. For this reason, the first commercial trip on the upper Klamath River was only ten years ago and use has increased steadily since then. Most recreational guidebooks were published before the river was known to be safely runnable. Other guidebooks describe easily accessible places, unlike the upper Klamath River. Recent publications acknowledge the unique qualities and growing popularity of the upper Klamath River for whitewater rafting.

Comment: Recreational fishing should be considered an "outstandingly remarkable value" for all three segments. The Oregon Department of Fish and Wildlife has made a considerable effort to protect and enhance this fishery resource.

Response: This change was made for segments 1, 2, and 3 in the Outstandingly Remarkable Values (Recreation Resources) section and table 3-1 in chapter 3.

Outstandingly Remarkable Values-Other Similar Values

Comment: Native Americans have long inhabited this region. The studied portion of the upper Klamath River are particularly important to the area's Native American peoples because it has long been used for important spiritual and cultural purposes.

Response: Native American traditional use was added as an outstandingly remarkable value for segment 2 in the Other Similar Values section in chapter 3 based on information provided to the BLM during the comment period.

Chapter 4

Classification Categories

Comment: Segment 1 could be managed as recreational under the Wild and Scenic Rivers Act.

Response: Segment 1 does not meet the criteria for eligibility or the criteria for a recreational classification. The classification criteria are described in table 4-1 in chapter 4. The Classification Determination section in chapter 4 discusses the classification of segment 1.

Comment: Segment 2 should be subdivided at Frain Ranch (RM 214.3) and classified from the J.C. Boyle Powerhouse to Frain Ranch as scenic and from Frain Ranch to the Oregon-California state line as wild.

Response: The lower portion of segment 2 does not meet either the water quality or the accessibility criteria of a wild classification. Table 4-1 in chapter 4 lists and describes the classification criteria.

Classification Criteria-Water Quality

Comment: The final study report should reference the water quality plan for the Upper Klamath Lake, Klamath River, or Klamath Basin that is mentioned in chapter 4 of the draft study report.

Response: The State has primary responsibility to prevent, reduce, or eliminate pollution. It is currently developing water quality assessment plans and control strategies for these waterbodies that are either not meeting or suspected of not meeting water quality standards and thus not supporting beneficial uses. As part of these studies, Oregon DEQ (1988) is establishing total maximum daily loads for municipalities and industries discharging effluent into the Klamath River. This serves as the water quality improvement plan mentioned in table 4-1.

Comment: The final study report should state whether water quality is high enough for designation of the river.

Response: The water quality of the upper Klamath River does not affect its qualifications for inclusion in the National Wild and Scenic Rivers System. The final study report addresses this in the Classification Determination section in chapter 4 under segment 2.

Chapter 5

Reasonably Foreseeable Potential Effects Due to Designation

Comment: The suitability analysis does not adequately discuss the positive and negative effects of designation.

Response: The suitability analysis has been expanded in the final study report. Factors considered in the suitability determination are now documented in chapter 5. The description of alternative management strategies (chapter 5 in the draft river study) is now included with the suitability discussion (chapter 6 in the draft river study) because the analysis of alternatives is a part of the suitability determination; this was not clear in the draft study report.

Timber Harvest

Comment: Under alternative management strategies 2 and 3, timber harvest would be administratively withdrawn. The Question and Answer sheet on the Wild and Scenic Rivers Act (May 1, 1989) notes that "Timber harvest on federal lands would not be significantly affected by a Wild and Scenic River designation and that existing plans already place constraints on timber harvest in river corridors."

Response: The actions described for each alternative management strategy were examples of possible management actions that could occur under each strategy, not actual scenarios that would be required. This particular

management action (administrative timber withdrawal) caused much confusion and has been excluded from the final river study. This action could be considered as part of an alternative in the BLM's resource management planning process and associated public involvement.

Comment: Wild and scenic designation would make thousands of acres of prime forest unavailable for harvest.

Response: This is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. The existing BLM Jackson-Klamath land use plan already places constraints on timber harvest on public land, and the State Scenic Waterway places constraints on private land within 1/4-mile of the river in segment 2. Beyond this, designation would not significantly impact timber harvest levels or silvicultural practices. Timber harvest is not necessarily prohibited in river corridors designated as scenic or recreational.

Agriculture and Grazing

Comment: The study area is far downstream and several hundred feet in elevation below areas of irrigated agriculture; therefore, designation would have no effect on present or future agriculture in the Klamath Basin.

Comment: Designation could freeze future agricultural growth and negatively impact current activities. The final study report should address this issue.

Comment: Downstream farming potential will be affected by a wild and scenic designation.

Response: The irrigation issue is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. Current levels of agriculture and grazing in the study area generally would not be affected; however, future increased use could be affected. Designation would have no effect on downstream farming potential.

Existing Hydroelectric Projects

Comment: Future construction activities at the J.C. Boyle Powerhouse could be opposed because of its close proximity to a wild and scenic river segment.

Response: Management guidelines for wild and scenic rivers in Oregon and Washington (BLM 1989) allow maintenance of existing facilities or construction of new structures provided they harmonize with the surrounding environment.

New Hydroelectric Projects

Comment: The final study report should indicate whether designation of the river would hinder future types of hydroelectric development on the Klamath River.

Response: This is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. New dams, reservoirs, and impoundments in segment 2 are inconsistent with provisions in the State Scenic Waterways Act. Section 7(a) of the Wild and Scenic Rivers Act prohibits hydroelectric facilities in designated segments. Hydroelectric facilities are not necessarily prohibited upstream or downstream of designated segments, provided they do not negatively impact the outstandingly remarkable values in the designated segments.

Comment: The BLM should include more definitive information on what would be lost if the proposed Salt Caves project is approved and constructed (including the "no dam" alternative).

Response: The effects associated with licensing and construction of all alternatives for the proposed Salt Caves hydroelectric project are described in the FERC EIS. The impacts include those that would be precluded by wild and scenic designation. Both documents (the BLM eligibility and suitability report and the FERC EIS) should be read for a complete "picture" of potential effects for the Klamath River Canyon.

Recreation

Comment: The Klamath River has consistently been used by anglers, hunters, and the like. The final study report should explain that, if the river is designated, many people will not be able to enjoy it anymore.

Response: Designation by itself would not discourage or restrict recreational use of the upper Klamath River. It is possible, however, that the solitude associated with the existing semi-primitive recreational experience opportunities could be diminished if designation resulted in increased visitation. Should designation occur, the required river management plan would include actions to control impacts associated with increased visitation.

Klamath River Basin Compact

Comment: The final study report should reflect that the Oregon Attorney General opinion OP-6268 (September 21, 1988) concludes that the Klamath River Basin Compact does not affect Congressional authority to designate the Klamath as a wild and scenic river.

Comment: Designation would be in direct conflict with the Klamath River Basin Compact.

Response: This is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. The position of the State of Oregon reflects the Attorney General's opinion. The chairperson of the Klamath River Basin Compact Commission argues that designation is in conflict with the Compact. The position of the BLM is that section 13(e) of the Wild and Scenic Rivers Act provides for the resolution of any conflict between designation and the Compact.

Comment: Multiple use encouraged by the Compact would be precluded by a designation and would be restricted to one use—recreation.

Response: If the river were designated, the canyon would not be restricted to one use. It would continue to be managed for all resource uses for which it is currently managed—recreation, range, timber, watershed (including existing hydroelectric power generation), wildlife and fish, and natural scenic, scientific, and historic values. Use of the Klamath River for agriculture and of the canyon for timber would continue at or near existing levels.

Multiple use, as defined in section 103(c) of the Federal Land and Policy Management Act of 1976, is:

*** the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

Existing and Future Water Rights

Comment: The Compact specifies that water rights may be acquired by appropriation. The final study report should indicate if wild and scenic river designation would preclude future appropriations.

Comment: A Wild and Scenic designation would effectively preclude offstream storage within or above the study segments, which would mean the end of expansion of agriculture and of having enough water for adequate fish flows in the river in dry years. The final study report should address this impact.

Response: This is addressed in the Reasonably Foreseeable Potential Impacts section in Chapter 5. Existing water rights would not be adversely affected. Future water appropriations, including offstream storage, could be allowed within a designated river to the extent they are consistent with State law, the Compact, and Section 13 of the Wild and Scenic Rivers Act.

Comment: The final study report should indicate how designation would affect beneficial uses of water in the upper watershed and its tributaries and if beneficial uses of upstream water could be curtailed to satisfy criteria developed for designated segments.

Comment: The final study report should indicate if diversions could be increased to meet increased demands of irrigated agriculture or residential development.

Response: This is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. Under section 13(d) of the Wild and Scenic Rivers Act, the States continue to have jurisdiction over water use, so long as the values for which the river was designated are not impaired.

Comment: The final study report should indicate if designation would severely restrict expansion of the Klamath Project by the Bureau of Reclamation as water demand increases, and if designation could eliminate the possibility of diverting Klamath Project water into the water-deficient area of Butte Valley, California.

Response: This is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. Existing irrigation systems with established water rights, such as the Klamath Project, would not be affected. The Klamath River Basin Compact limits the superiority of water use for irrigation to 100,000 acres in California and 200,000 acres in Oregon. New water diversions upstream would follow State procedures and would not be constrained by a designated river so long as no adverse impact would occur to the values for which the river was designated.

Comment: The study report should address whether designation could result in court actions over instream uses for recreation and wildlife versus diversion for people, crops, and livestock.

Response: A discussion of some of these issues is addressed in the Reasonably Foreseeable Potential Effects section in chapter 5. A discussion of possible court actions based on conflicting water uses is beyond the scope of this study.

Water Quality

Comment: The final study report should include the effect of designation on water quality standards and both natural and human-caused pollution.

Response: Water quality is constrained by existing State standards, not by the Wild and Scenic Rivers Act. Water quality criteria for potential wild, scenic, and recreational rivers are discussed in table 4-1 in chapter 4. The potential effect of designation on water quality is included in the Reasonably Foreseeable Potential Effects section in chapter 5. Guidelines for management of water quality in designated Federal and State Scenic Waterways are described in appendix H.

Economics

Comment: The final study report should include an evaluation of the economic impacts on the Klamath Basin if a "wild and scenic" designation is made for this stretch of the river. This includes the loss in income, property taxes, and employment to Klamath County if private land were withdrawn from production in the study area.

Response: A summary of existing economic studies and information is included in the final river study in appendix I. Qualitative impacts from designation of the upper Klamath River has been added to chapter 5. Private land would not be withdrawn from production as a result of designation.

BLM Lakeview District Multiple Use Advisory Council

The Multiple Use Advisory Council held two meetings to address the adequacy of the draft study report. The first meeting was held on December 7, 1989 and included oral statements from ten agencies and 27 members of the public. Several written statements were presented to the Council during the meeting. The second meeting was held on January 11, 1990 as a follow-up to the initial meeting. The following two recommendations were made by the Multiple Use Advisory Council at the January meeting:

1. "We accept the Draft Eligibility and Suitability Report for the Upper Klamath River Wild and Scenic River Study with the addition of the following information:
 - a. Consideration of the stretch of the river from the Caldera Rapids to the state line for wild river designation.
 - b. Reconsider whether the river meets the definition of free-flowing.
 - c. Include the FERC EIS for the Salt Caves Hydroelectric Project as part of the package which is sent to Congress.
 - d. Include a section on economics.
 - e. Look at the effect of designation of relicensing existing hydroelectric projects, upstream water rights, and offstream storage.
 - f. Look at the environmental impacts of the No-dam alternative of the Salt Caves Hydroelectric Project.
 - g. Look at the potential conflicts with the Klamath River Compact.
 - h. Consider the effects to multiple use management of the river."
2. "The Lakeview District Multiple Use Advisory Council goes on record opposing designation of the upper Klamath River as a wild, scenic, or recreational river."

Appendix H

A Comparison of Management Guidelines for Federal Wild and Scenic Rivers and State Scenic Waterways

National Wild and Scenic Rivers System

“Each component of the National Wild and Scenic Rivers System shall be administered in such a manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration, primary emphasis shall be given to protecting its esthetic, scenic, historic, archaeological, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.” Sec. 10(a) Wild and Scenic Rivers Act (PL 90-542).

Section 10(a) is interpreted by the Secretaries of the Interior and Agriculture as stating a nondegradation and enhancement policy for all designated river areas, regardless of classification.

Columns 1 and 2 (following) explain guidelines for management of wild and scenic rivers on Bureau of Land Management and National Forest System lands in Washington and Oregon.

Oregon State Scenic Waterways

Column 3 explains management rules and guidelines for Oregon Scenic Waterways without adopted management plans, such as the upper Klamath River. Interim management direction comes from the Scenic Waterways Act (ORS 390.805), the scenic waterway administrative rules (OAR 736-Division 40), Parks Division policies, and other State agency administrative rules. Until a specific river management plan is completed, management and regulatory decisions on the river are guided by those rules and policies. In addition, Parks is required to ensure, through the notification/review process, that new activities will not “substantially impair the natural beauty” of the scenic waterways. In reviewing new projects, Parks also considers the potential management plan classification of the river. A project may be denied if its approval would result in changing the potential river classification.

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
	<p>Scenic river areas are defined by the Act to be "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads." Management of scenic river areas should maintain and provide outdoor recreation opportunities in a near-natural setting. The basic distinctions between a "wild" and a "scenic" river area are the degree of development, types of land use, and road accessibility. In general, a wide range of agricultural, water management, silvicultural and other practices could be compatible with scenic river values, providing such practices are carried on in such a way that there is no substantial adverse effect on the river and its immediate environment.</p>	<p>Recreational river areas are defined by the Act to be "Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." Management of recreational river areas should be designed to protect and enhance existing recreational values. The primary objective will be to provide opportunities for the public to participate in recreation activities dependent on or enhanced by the largely free-flowing nature of the river.</p>	<p>A scenic waterway includes the river and all lands within 1/4-mile of the river bank as measured horizontally from the ordinary high water mark. The highest and best uses of water within a scenic waterway is for fish, wildlife and recreation.</p>
FORESTRY PRACTICES	<p>Forestry practices including timber harvesting could be allowed provided that such practices are carried on in such a way that there is no substantial adverse effect on the river and its immediate environment. The river area should be maintained in its near natural environment. Timber outside the boundary but within the visual seen area should be managed and harvested in a manner which provides special emphasis on visual quality.</p>	<p>Forestry practices including timber harvesting would be allowed under standard restrictions to protect the river environment and its associated values.</p>	<p>The Forest cover on related adjacent land is a part of the scenic beauty of the scenic waterway and notification to the State of planned timber harvest operations must be made one year prior to commencement. The notification must include a plan specifying timber to be cut, road locations, logging methods, slash cleanup, soil stabilization, revegetation measures and other details required. Approved projects shall not substantially impair the natural beauty of the scenic waterway as viewed from the river.</p>

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
AGRICULTURAL PRACTICES AND LIVESTOCK GRAZING	A wider range of agricultural and livestock grazing uses is permitted to the extent currently practiced. Row crops are not considered as an intrusion of the "largely primitive" nature of scenic corridors as long as there is not a substantial adverse effect on the natural-like appearance of the river area.	Lands may be managed for a full range of agricultural and livestock grazing use to the extent currently practiced.	Existing use in the form of grazing or farming of the related adjacent land is a part of the scenic beauty of the waterway. State notification is not required for: construction of fences; maintenance of farm buildings, fences, or appurtenances (equipment) necessary to existing use; laying of irrigation lines; most pumphouse construction; most additions to farm buildings; crop rotation; variations in grazing land management; placing of grazing land under cultivation, except within potential Natural River Areas; and construction of most silos and grain storage facilities, and other structures or buildings as are needed in connection with the existing use of the related adjacent land except within potential Natural River Areas.
RECREATION 1. Facilities	Larger scale public use facilities such as moderate size campgrounds, interpretive centers, and administrative headquarters are allowed if such structures are screened from the river. Modest and unobtrusive marinas also can be allowed.	Interpretive centers, administrative headquarters, campgrounds, and picnic area may be established in close proximity to the river. However, recreational classification does not require extensive recreation development.	Facilities are permitted to be visible from the river, in most cases. Notification and approval is required. All new projects should be compatible with the surrounding area and not detract from the river's natural and scenic beauty. Within public recreation sites and transient public trailer parks where travel trailers, campers, motor homes, and similar vehicles are permitted by the public agency, firm, or individual maintaining the facility, their transient, short-term use by travelers is allowed, but they shall not be left on the site during their user's absence of more than three

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
RECREATION 1. Facilities (Continued)			<p>days. No signs or other forms of outdoor advertising that are visible from waters within a scenic waterway shall be constructed or maintained. Property protection signs (No Hunting, No Trespassing, etc.) are exempted.</p> <p>Refuse, scrap, trash, and garbage which is not placed in receptacles provided for that purpose at maintained recreation sites shall not be buried or abandoned, but shall be taken out of the scenic waterway for proper disposal. All persons shall avoid pollution of the water, land, and air within scenic waterways in any manner whatsoever.</p>
2. Public Use and Access	<p>Recreation use including but not limited to hiking, fishing, hunting, and boating is encouraged in river areas to the extent consistent with the protection of the river environment and outstanding remarkable values. Public use and access may be regulated and distributed where necessary to protect and enhance river values.</p>	<p>This is the same as for scenic river classification.</p>	<p>Nothing in the State Act or in the rules affords to any person any right to trespass upon the property of another or in any way alter the rights of landholders. All persons must respect the rights and sensibilities of those who make their homes and livelihoods with the scenic waterways.</p> <p>Living or standing trees or plants shall not be cut for burning or for any other purpose by persons using scenic waterways for recreation.</p>

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
2. Public Use and Access (continued)			<p>Persons using the scenic waterways for recreation shall not harass or in any way interfere with livestock or domestic animals, whether on private or public land, or damage fences lawfully placed on such lands for their management.</p> <p>Natural springs shall not be damaged or in any way rendered unusable by persons or animals. State Parks asks all persons to leave in passing no mark upon the land that might diminish its value to another, for the unspoiled beauty of these waterways is the common heritage to all.</p>
3. Motorized Travel	<p>Motorized travel on land or water may be permitted, prohibited, or restricted to protect the river values. Prescriptions for management of motorized use may allow for search and rescue and other emergency situations.</p>	<p>Motorized travel on land will generally be permitted, on existing roads. Controls will usually be similar to that of surrounding lands. Motorized travel on water will be in accordance with existing regulations or restrictions.</p>	
SOLID WASTE, POLLUTION, AND SANITATION			<p>Owners, occupants, and users of related adjacent land shall comply with the rules and regulations of the Department of Environmental Quality relating to solid waste control; water, air, and noise pollution control; and sewage disposal.</p>

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
UTILITY RIGHTS-OF-WAY	New transmission lines, natural gas lines, water lines, etc. are discouraged unless specifically prohibited outright by other plans, orders, or laws. Where no reasonable alternative exists, additional or new facilities should be restricted to existing rights-of-way. Where new rights-of-way are unavailable, locations and construction techniques will be selected to minimize adverse effects on river area related values and fully evaluated during the site selection process.	This is the same as for scenic river classification.	State Parks, whenever practicable, will require the sharing of land and airspace by such facilities and utilities. All permissible transportation facilities and utilities shall be so located as to minimize impairment of the natural beauty of the scenic waterway. For example, it will be desirable to place electrical and telephone lines underground where reasonably practicable.
ROAD AND TRAIL CONSTRUCTION	Roads may occasionally bridge the river area, and short stretches of conspicuous or longer stretches of inconspicuous and well-screened roads or screened railroads could be allowed. Maintenance of existing roads and any new roads will be based on the type of use for which the roads are constructed and the type of use that will occur in the river areas. New trails may be constructed to enhance the values for which the river was designated.	Parallel roads or railroads could be constructed on one or both river banks. There can be several bridge crossings and numerous river access points. New trails may be constructed as long as there is no conflict with other river values.	No roads, railroads, or other facilities for transportation or utilities shall be constructed or improved within a scenic waterway without notification and approval.
MINING	Subject to existing regulations (e.g., CFR 228 and 43 CFR 3809) and any future regulations that the Secretaries of Agriculture and Interior may prescribe to protect the values of rivers included in the National System, new mining claims and mineral leases could be allowed, and existing operations allowed to continue. All mineral activity must be conducted in a manner that minimizes surface disturbance, sedi-	This is the same as for scenic river classification.	All prospecting, mining, and quarrying operations, including removal or movement of gravel, rocks, and sand within the area from the ordinary high water line upland a distance of 1/4-mile require notification to State Parks. Such notification shall include plans to ensure that debris, silt, chemicals, or other materials shall not be discharged into or allowed to reach the waters within a scenic

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
MINING (Continued)	mentation and pollution, and visual impairment. Reasonable mining claims and mineral lease access will be permitted. Mining claims perfected after the effective date of the scenic river designation can be patented only as to the mineral estate and not the surface estate.		waterway and that the natural beauty of the scenic waterway shall not be impaired substantially. Placer mining is prohibited. Placer mining is the process of extracting minerals from a placer utilizing mechanized or hydraulic equipment, except a motorized surface dredge with a suction hose intake four inches or less in diameter.
WATER 1. Quality	Water quality will be maintained or improved to meet Federal criteria or Federally approved state standards. River management plans shall prescribe a process for monitoring water quality on a continuing basis.	This is the same as for Scenic River classification.	
2. Water Supply	Water supply dams and major diversions are prohibited. Maintenance of existing facilities and construction of some minor new diversion structures would be permitted provided that the area remains natural in appearance and the practices or structures harmonize with the surrounding environment.	New major water structures are prohibited. Existing low dams, diversion works, rip rap, and other minor structures may be maintained provided the waterway remains generally natural in appearance. New minor diversion structures or management practices, e.g., water bars, diversion ditches, may be allowed provided that the area remains generally natural in appearance and the structures harmonize with the surrounding environment.	No dam or reservoir or other water impoundment facility shall be constructed on waters within scenic waterways. No new water rights may be issued by the State Water Resources Department unless flow is sufficient to satisfy existing rights and fish, wildlife, and recreation needs. Nothing in the State Scenic Waterway Act affects the authority of the Water Resources Commission to construct and maintain stream gauge stations and other facilities related to the commission's duties in administration of the water laws.

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
3. Flood Control	Flood control dams and levees are prohibited. Existing structures protecting major improvements, homes, bridges, highways, etc. may be maintained.	Existing flood control and protection works may be maintained. New structures to provide bank stabilization such as rock or log placement, must not affect free-flowing characteristics nor conflict with outstandingly remarkable values. In addition, new structures must be compatible with the classification and the area must remain natural in appearance with structures harmonizing with the environment.	
4. Hydroelectric Power	No development of hydroelectric power facilities would be permitted.	No development of hydroelectric power facilities would be permitted.	<p>State Water Resources will not issue water rights for hydroelectric development within a scenic waterway.</p> <p>The Energy Facility Siting Council will not issue a site certificate for a hydroelectric development within a scenic waterway.</p>
5. Ground Water	Federal agency ground water development for range, wildlife, recreation, or administrative facilities may be permitted if there are no adverse affects on outstandingly remarkable values.	This is the same as for scenic river classification.	

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
PROTECTION 1. Fire Protection and Suppression	<p>Management and suppression of fires within a designated river area will be carried out in a manner compatible with contiguous Federal lands. On wildfires, methods will be utilized that minimize suppression activities that cause long term impacts on the river and river area. Presuppression and prevention activities will be conducted in a manner which reflects management objectives for the specific river segment. Prescribed fire may be utilized to maintain or restore ecological condition or to meet objectives specified in the river management plan.</p>	<p>This is the same as for Scenic River classification.</p>	<p>Fires shall be made only in compliance with State law and only when and where there is no possibility of their causing damage. Conditions of wind and weather, proximity of vegetation or flammable materials, and other factors as prudence dictates shall be most carefully considered. No open fire shall be made unless a shovel, axe, and bucket of water are nearby. No open fire shall be left unattended and all fires shall be completely extinguished with water after use. Permissible fires shall be of the smallest practicable size.</p>
2. Insects, Disease and Noxious Weeds	<p>The control of forest and rangeland pests, diseases, and noxious weed infestations will be carried out in a manner compatible with the intent of the Act and management objectives of contiguous Federal lands.</p>	<p>This is the same as for scenic river classification.</p>	
CULTURAL RESOURCES	<p>Historic and prehistoric resource sites will be identified, evaluated, and protected in a manner compatible with the management objectives of the river and in accordance with applicable regulations and policies. Where appropriate, historic or prehistoric sites will be stabilized, enhanced, and interpreted.</p>	<p>This is the same as for scenic river classification.</p>	<p>Except as provided by law, antiquities, relics, artifacts, fossils, and souvenirs shall not be removed from the site of their discovery or otherwise harmed. Archaeological sites and fossil beds shall not be disturbed without proper authority under law.</p>

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
FISH AND WILDLIFE HABITAT IMPROVEMENT	The construction and maintenance of minor structures for protection, conservation, rehabilitation, or enhancement of fish and wildlife habitat are acceptable provided they do not affect the free-flowing characteristics of the river, nor conflict with outstandingly remarkable values. In addition, structures and practices should be compatible with the classification, assure the area remains natural in appearance, and harmonize with the surrounding environment.	This is the same as for scenic river classification.	Nothing in the State Act affects the authority of the Oregon Department of Fish and Wildlife to construct facilities for the passage or propagation of fish or to exercise other responsibilities in managing fish and wildlife resources.
WILDERNESS AND WILDERNESS STUDY AREA	Management of river areas which overlap designated wilderness or wilderness study areas will meet whichever standard is highest. If an area is released from wilderness study area status and the associated interim management policy, the applicable river classification guidelines and standards would then apply.	This is the same as for scenic river classification.	
VISUAL RESOURCE	Retention of the existing landscape character is the objective. Management activities can occur, provided the change to the characteristic landscape is low and does not attract the attention of the casual observer.	Partial retention of the existing landscape character is the objective. Management activities can occur, provided the change to the characteristic landscape is no more than moderate and does not dominate the view of the casual observer.	

Description	Scenic Rivers	Recreational Rivers	Oregon State Scenic Waterway
STRUCTURES (residential; commercial, such as farms, resorts, etc.; and industrial)	Consider the following as a guide for the management of private lands: Any concentration of habitation is limited to relatively short reaches of the river corridor. New structures that would have a direct and adverse effect on river values would not be allowed.	Consider the following as a guide for the management of private lands: Small communities as well as dispersed or cluster residential developments are allowed. New structures are allowed for both habitation and for intensive recreation use.	In most circumstances, no structures, buildings, or other improvements shall be made, erected, or placed on related adjacent lands without notification. Permitted new structures, buildings or other improvements on related adjacent lands which can be seen from the waters within a scenic waterway shall be of such design and be constructed of such materials as to be unobtrusive and compatible with the scenic qualities of the area.
STREAMBANK PROTECTION			Filling in rivers, removing soil and gravel from rivers, or changing riverbanks in any way, regardless of the amount of soil and rock involved, requires special approval of the Division of State Lands and the State Land Board.

Appendix I

Inventory of Economic Studies

In response to public comment, the following appendix has been developed to assist readers interested in economic topics associated with the designation of the upper Klamath River under the Wild and Scenic Rivers Act. Selected studies discussing the non-use value of rivers have been summarized. Also selected sources discussing the economic issues associated with electrical energy development and generation in the region have been identified and briefly summarized. More information on the economics associated with hydroelectric development in the upper Klamath River can be found in the FERC Salt Caves Hydroelectric Project EIS.

No attempt has been made to analyze or evaluate the information herein. In most cases the complete document should be consulted by readers wishing to make an evaluation of the studies or information cited.

City of Klamath Falls. *Application for License Salt Caves Hydroelectric Project: Analysis of the Potential Economic Effects on the Klamath River Whitewater Rafting Industry.* October 1988.

This document was submitted to the Federal Energy Regulatory Commission (FERC) by the City of Klamath Falls as instructed by FERC in response to a February 13, 1988 letter from the Bureau of Land Management (BLM). An "economic analysis for the loss of revenues from whitewater rafters unable to use the upper Klamath River for the various alternatives proposed" was requested. As submitted, this document summarizes the methodology used to analyze the potential economic effects on the Klamath River whitewater rafting industry and the conclusions reached. In addition, the comments of public and agency reviewers are included.

An analysis of current whitewater rafting use estimated that \$237,999 in revenues accrue directly to the whitewater rafting industries of Oregon and California annually. Using a Secondary Spending Multiplier of 1.7 (Source: Oregon State Department of Employment, Mike Mahan, DOE Economist) the total economic benefit was estimated to be \$413,449 annually.

Additional analyses were done to estimate possible changes in rafting industry revenues in the future as might be constrained by the Salt Caves project. A variety of industry growth rates and release scenarios associated with Salt Caves mitigation were analyzed.

The study concluded the six rafting release scenarios identified by the City would be capable of meeting existing average use levels.

The present value analysis (50-year period) found adverse effects to the commercial rafting industry ranging from minus 1 percent to 16 percent. These reductions of present value increased as assumed growth rates increased.

The City of Klamath falls analysis concluded rafting release "scenarios (1)" (Four 3-day (Friday-Sunday) "or (2)" (Six 2-day (Saturday-Sunday) releases) "are capable of providing sufficient opportunity to meet existing average commercial use levels on the upper Klamath River, and allow for commercial industry growth of approximately 20 percent that could take place with the growth allowance (160 users per day vs. 200 users per day) being considered by the city. In addition, no adverse effects to private users are anticipated."

City of Klamath Falls. *Supplemental Comments of the City of Klamath Falls on Comparative Evaluation of No-Action Alternatives Regarding the Federal Energy Regulatory Commission Draft Environmental Impact Statement for the Salt Caves Hydroelectric Project.* January 1990.

This evaluation compares several Salt Caves No-Dam Alternatives to a range of No-Action (No Salt Caves Project) alternatives. Varying minimum instream flows, including run-of-river, and relicensing of the J.C. Boyle facility, are specifically addressed.

The analysis used the value of electrical capacity and energy production to compare the 12 alternatives examined. Values were estimated using the costs of thermal replacement of current and estimated future capacity and generation. Using these values, present values were calculated to facilitate comparison of alternatives for the 30-year post-relicensing period (2006-2035). Tables III-20 and III-21 combined and reproduced here as Present Value of Capacity and Energy for 2006 to 2035 (1990 \$ x Million) displays the calculated present values.

The City of Klamath Falls concluded from this analysis, "the Salt Caves No-Dam Alternative will greatly enhance the economic value of capacity and energy produced on the upper Klamath river. The present value 30-year analysis has shown that, under a peaking operation, the combined output would be over \$400 million greater than the No-Action run-of-river alternative. Further, the Proposed Action will maintain recreational rafting on the river. By comparison, the post-2005 J.C. Boyle run-of-river operation with 200 cfs minimum instream flow without Salt Caves No-Dam Alternative would eliminate river rafting."

"In addition to the foregone \$409.2 million of power between the No-Action and the Proposed Action cases for the years 2006 to 2035, the No-Action alternative would preclude the production of \$194.5 million worth of power from the Salt Caves operation from 1995 to 2005 before J.C. Boyle is relicensed. The total foregone value of power from the No-Action alternative from 1995 through 2035 is therefore \$603.7 million."

Present Value of Capacity and Energy for 2006 to 2035 (1900 \$ x Million)
(Tables 111-20 and 111-21 combined)

Case Value	Description	30 Year Present
A	NO ACTION Existing JC Boyle Operation w/o Salt Caves No-Dam 100 cfs minimum instream flow (MIF) ¹	\$307.6
A-1	Existing JC Boyle Operation w/o Salt Caves No-Dam 200 cfs MIF ¹	\$290.8
A-2	Existing JC Boyle Operation w/o Salt Caves No-Dam 300 cfs MIF ¹	\$275.2
A-3	JC Boyle run-of-river operation w/o Salt Caves No-Dam with 100 cfs MIF ¹	\$237.3
A-4	JC Boyle run-of-river operation w/o Salt Caves No-Dam with 200 cfs MIF ¹	\$222.3
A-5	JC Boyle run-of-river operation w/o Salt Caves No-Dam with 300 cfs MIF ¹	\$207.2
B	PROPOSED ACTION Salt Caves No-Dam w/existing 100 cfs MIF; w/16 rafting release days	\$323.9
A+B	COMBINED VALUE Existing JC Boyle Operation plus Salt Caves No-Dam 100 cfs MIF w/16 rafting release days ¹	\$631.5
C	Salt Caves No-Dam w/existing 100 cfs MIF 1995-2005 Post 2005 existing oper. w/MIF 200 cfs; w/16 rafting release days	\$305.4
D	Salt Caves No-Dam w/existing 100 cfs MIF 1995-2005; Post-2005 existing oper. 300 cfs; w/16 rafting release days	\$288.3
E	Salt Caves No-Dam w/existing 100 cfs MIF 1995-2005 Post-2005 run-of-river operation w/100 cfs; 1995-2005 raft days=16, Post 2005 raft days=0	\$260.0
F	Salt Caves No-Dam w/existing 100 cfs MIF 1995-2005; Post-2005 run-of-river operation w/200 cfs; 1995-2005 raft days=16, Post 2005 raft days=0	\$244.1
G	Salt Caves No-Dam w/existing 100 cfs MIF 1995-2005; Post-2005 run-of-river operation w/300 cfs; 1995-2005 raft days=16, Post 2005 raft days=0	\$227.9

¹MIF as measured at the J.C. Boyle Dam
MIF = minimum instream flow

Johnson, R.L., Bregenzer and Shelby. *Contingent Valuation Question Formats: Dichotomous Choice vs Open-Ended Responses*. Dept. of Forest Resources, Oregon State University. In Press

"ABSTRACT. This paper uses a 1985 survey of Rogue River noncommercial whitewater recreationists to empirically examine an application of the Contingent Valuation Method. Two different techniques were used: the open-ended question and dichotomous choice question. One half of the sample was administered the open-ended question. Responses to this question were then used to establish distribution of the dichotomous choice offers. Using a binary choice logit model, the median and the mean values of willingness to pay were estimated and compared."

"The open-ended format was straight-forward; respondents were asked to write in the maximum amount they would pay for a single trip permit for the Rogue River."

In the dichotomous choice method "the respondent is presented with a dollar amount for the price of a hypothetical permit (i.e., a price to which they respond either 'yes', they would pay that amount or 'no', they would not.)."

Permit Price Results:

	Open-ended	Dichotomous choice
Mean:	\$32.66	\$52.93
Median:	\$25.00	\$48.32

Klamath County, *Regional Economic Development Strategy* Executive Summary. Excerpt courtesy of Oregon Economic Development Office.

Oregon's Regional Economic Development Strategy process encourages counties and other local governments to join together and develop a strategy that promotes economic growth and diversification in their region. Selected projects are funded by lottery funds designated for economic development. Klamath County's development strategy is summarized in the following excerpt.

"Klamath County's regional economic strategy is technology transfer. The proposed strategy is intended to leverage the two unique assets of Klamath County, namely, Oregon Institute of Technology (OIT) and Kingsley Field, into an economy building on the technology, being developed at OIT to help establish, expand and recruit technology based businesses to Klamath County. The primary goal of this strategy is to establish a high technology component supply base, accessible to the regional markets of Washington, Oregon and California, as well as the national markets and the Pacific Rim economies."

"The strategy consists of five parts: OIT, a small business incubator, a free trade zone, marketing and transportation."

Estimates of employment at full implementation of the strategy were made by the county. Estimates were as follows:

Range of Jobs	
1 Air Carrier	50 - 2,000
15 High Technology Firms	150 - 750
10 Warehouses	50 - 500
6 Assembly Firms	150 - 270
4 Production Firms	400 - 1,000
2 Aircraft Maintenance Firms	25 - 1,000
Construction:	
Buildings	50 - 2,500
Roads	100 - 400
Water Lines	50 - 200
Security:	10 - 75
Transportation:	
Airport related	25 - 100
Rail	75 - 500
Truck	50 - 500
Totals	1,185 - 9,795

Mitchell, R.C. and Carson, R.T. *Using Surveys to Value Public Goods. The Contingent Valuation Method.*
(c) 1989 Resources for the Future Washington, D.C.

This text helps in understanding the numerous studies that value public goods using the contingent valuation method. The following excerpts from the forward summarize the purpose of the book.

"Using Surveys to Value Public Goods. The Contingent Valuation Method provides decision makers, policy analysts, and social scientists with a detailed discussion of a new technique for the valuation of goods not traded in private markets. Termed contingent valuation, the technique draws upon economic theory and methods of survey research to elicit directly from consumers the values they place upon public goods."

"The advantage of contingent valuation over the previous indirect approaches, concerns the nature of the values that may be addressed. The indirect methods, exemplified by the Clawson travel-distance approach, are best applied to estimate values concerning the use of a public good, while the contingent valuation method may be employed to estimate values not intimately linked to use — for example, the desire of individuals to pass pristine natural environments on to future generations."

"Using Surveys to Value Public Goods provides the reader with a summary of this current research and a critical evaluation of the method as a tool for public goods valuation."

NWPPC and BPA developed three forecasts to aid in projecting future electrical needs in the region. Five scenarios were analyzed, with the medium scenario representing forecasts of national economic variables by Warton Econometric Forecasting Associates. Varying assumptions about fuel prices, regional shares of national employment growth by industry, and specific assumptions about the viability of the regional aluminum industry were used to develop the four region specific scenarios. The following table shows industry shares projected for 2010 in each of the five scenarios.

Industry Shares by Growth Scenario.

Comparison of 1987 and 2010						
	1987	2010				
		High	Medium-High	Medium	Medium-Low	Low
Persons per Household	2.85	2.20	2.32	2.32	2.32	2.59
Employment/Population Ratio	0.43	0.51	0.49	0.47	0.45	0.42
Percent of Total Employment	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing	16.1	11.3	11.3	11.4	11.2	11.1
Nonmanufacturing	83.9	88.7	88.7	88.6	88.8	88.9
Percent of Manufacturing	100.0	100.0	100.0	100.0	100.0	100.0
Lumber and Wood Products	21.8	14.4	15.4	16.0	16.6	17.5
Transportation Equipment	20.1	19.9	19.6	18.9	17.9	17.0
Food and Kindred Products	12.4	9.9	10.8	11.1	11.6	12.4
Electronics (SIC 35,36,38)	15.4	24.6	22.8	22.1	21.3	20.4
Pulp and Paper Products	4.8	3.4	3.7	4.0	4.3	5.1
Other	25.5	27.8	27.7	27.9	28.3	27.6
Percent of Nonmanufacturing	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	9.4	4.9	5.3	5.8	6.1	6.9
Mining	0.3	0.3	0.3	0.3	0.2	0.2
Construction	4.6	4.5	4.7	4.4	4.2	4.6
Transportation, Communication and Public Utilities	5.9	4.6	4.4	4.6	4.8	4.8
Wholesale & Retail Trade	27.3	29.8	30.2	30.5	30.3	29.8
Finance, Insurance & Real Estate	6.6	7.1	7.0	7.0	6.9	6.7
Services	23.6	29.0	27.9	27.7	28.1	26.9
Government	22.3	19.8	20.0	19.8	19.4	20.1

Oregon Department of Tourism, 1989. *The Economic Impact of Travel in Oregon*. Prepared by Dean Runyan Associates with Dick Conway and Associates.

This report prepared for the Oregon Economic Development Department, Tourism Division contains valuable information regarding the economic contribution made by tourism to Oregon's economy. Appendix A of the document details economic impacts by county. Data for Jackson and Klamath Counties have been reproduced here. No source for similar data in Siskiyou County has been located.

Travel-Generated Impacts, by County and Type of Accommodations

	Travel Expense (\$000)	Payroll (\$000)	Employment (Jobs)	Tax Receipts	
				Local (\$000)	State (\$000)
JACKSON					
Hotel/Motel	49,650	9,785	1,205	943	1,333
Commercial Campgrounds	11,650	1,915	211	0	484
Public Campgrounds	5,228	818	88	0	176
Friends/Relatives	15,280	2,641	296	0	533
Day Travel	2,321	406	43	0	74
Total	84,131	15,567	1,845	943	2,604
KLAMATH					
Hotel/Motel	18,944	3,323	416	372	508
Commercial Campgrounds	4,946	715	84	0	205
Public Campgrounds	6,591	911	103	0	222
Friends/Relatives	6,473	1,029	128	0	226
Day Travel	1,153	183	21	0	37
Total	38,110	6,163	754	372	1,201

Travel-Generated Impacts, by County and Type of Business, Oregon, 1987

	Travel Expense (\$000)	Payroll (\$000)	Employment (Jobs)	Tax Receipts	
				Local (\$000)	State (\$000)
JACKSON					
Accommodations	17,928	4,159	600	943	297
Eating/Drinking	19,537	4,887	684	0	353
Food Stores	7,944	804	68	0	143
Auto/Transport	13,040	523	49	0	1,344
Recreation	9,441	2,376	219	0	170
Retail Sales	16,239	2,814	221	0	293
Total	84,131	15,567	1,845	943	2,604
KLAMATH					
Accommodations	7,353	1,415	197	372	114
Eating/Drinking	8,483	2,129	324	0	153
Food Stores	4,372	415	35	0	79
Auto/Transport	6,424	202	26	0	646
Recreation	3,302	970	74	0	77
Retail Sales	7,173	1,029	97	0	129
Total	28,110	6,163	754	372	1,201

Size of Travel Industry, by County and Impact Type, Oregon 1987

	Travel Expense (\$000)	Payroll (\$000)	Employment (Jobs)
JACKSON			
Visitor Impacts	84,131	15,567	1,845
Air Travel	4,995	1,498	88
Total	89,126	17,065	1,933
KLAMATH			
Visitor Impacts	38,110	6,163	754
Air Travel	1,332	399	31
Total	39,442	6,563	785

Shelby, B., Johnson and Brunson. *Comparative Analysis of Whitewater Boating Resources in Oregon: Toward a Regional Model of River Recreation*. Dept. of Forest Resources, Oregon State University. In Press

"This report describes findings of a research project designed to fill some of the gaps in comparative information about whitewater boating resources in Oregon."

"The rivers chosen were the Clackamas, Deschutes, Rogue and Upper Klamath. These rivers are among the most popular whitewater resources in Oregon, yet differ in physical and social settings. Researchers evaluations were used to compare the basic characteristics of the rivers, but the bulk of the comparative data came from detailed surveys of users of all four rivers. The surveys were designed to measure the experiences provided by different rivers, as well as the characteristics of the people who engage in those experiences."

The pages of the report detailing results of the Upper Klamath River Study are produced herein.

Upper Klamath River

Setting description. The Klamath River rises in Oregon but flows mainly through California. Whitewater boating has been increasingly popular on a 15-mile stretch of the river between the Pacific Power and Light Co.'s Boyle powerhouse near the town of Keno, Oreg., and Copco Lake just across the California border. The water is held behind an upstream dam, then released through turbines for an average of eight hours daily, usually in the morning. There is only enough whitewater when the generators are operating, so boaters must normally launch by noon.

The riverbanks are in a "checkerboarded" area with alternating sections of private and BLM land. The city of Klamath Falls has proposed a hydropower facility which would divert the river just below Boyle Powerhouse, effectively destroying whitewater recreation for most of the year. Despite opposition from state agencies and the BLM, the proposal was still pending on Jan. 1, 1990. Partly in response to the dam proposal, the river has been declared a State scenic Waterway and is being studied for federal Wild and Scenic River status.

The Upper Klamath is considered a demanding river to run, with several rapids rating at or just below Class 5. Most of the roughest water is located just above the California state line, and many boaters camp overnight at a midway point just above these rapids. The river is paralleled by very poor roads, and nearly all launches take place at a single put-in, one mile below the Pacific Power facility. Though the Klamath is a blue-ribbon trout stream, it is not heavily fished in summer when catch-and-release regulations are in effect.

Use patterns. Somewhere between 75 and 90 percent of Upper Klamath boating occurs on commercially outfitted trips, but BLM records suggest that the proportion of private boaters is growing. Inflatable rafts account for 97 percent of the river traffic, with a few private boaters using kayaks. Private parties tend to camp along the river as do a sizeable minority of outfitted parties, particularly those based in northern California towns which are two hours or more from the launch area. Most camping occurs at a designated area about halfway between the put-in and Copco Lake. Since launches are done in the morning, camp is normally reached by early afternoon, and some outfitters bring fishing equipment, mountain bikes and other recreational equipment for their customers to use during the trip.

Nearly half of Upper Klamath boaters are people who are making a raft trip as part of a larger vacation trip, and about one-quarter of that group said they did not decide to float the river until they arrived in the town where their outfitter was based. Overall, 76 percent of respondents said they had begun planning their trips more than a week in advance. The Klamath can be floated any month in the year, but most boating is done in June, July, or August. Commercial passengers normally make no more than one trip per year, but private floaters tend to be repeat visitors, averaging 2.6 trips per year.

Social impacts and perceptions of the experience. Reported satisfaction levels are high, with 37 percent rating the trip as "perfect" and 48 percent calling it "excellent". Seventy percent said they definitely wanted to make a repeat trip. The perceived crowding score was 3.65, with 72 percent of respondents saying the river was at least slightly crowded.

Reported use impacts tended to match, or slightly exceed, boaters standards. Thus, while 58 percent spent no more than one hour in four within sight of other parties, 65 percent said use should remain within those levels. Similarly, the average reported waiting time at the launch site was two minutes longer than the average acceptable wait of 19 minutes. Campers reported being within sight of 1.3 other parties while the average standard was 0.9 parties. Use impacts varied widely. While 27 percent said they were almost never in sight of other boats, 19 percent saw other parties at least three-quarters of the time. Forty-eight percent reported no wait at the launch site, but others reported waiting as long as an hour.

Respondents tended to define the experience as semi-wilderness (33 percent) or undeveloped recreation (42 percent), while 8 percent called it wilderness. However, 19 percent said it should be wilderness, compared to 39 percent favoring semi-wilderness and 32 percent undeveloped recreation.

Conflicts between recreational users are rare on the Upper Klamath. Seventy percent had never experienced conflicts; of those who had experienced them, 56 percent said conflicts were rare. By far the largest source of discord was other boaters, accounting for 77 percent of the conflicts reported.

Economic value. The value of an Upper Klamath trip was estimated using the dichotomous-choice CVM method. The travel costs method was not used because nearly half of the respondents were on multiple destination trips, violating one of the major assumptions of the travel cost method. Two CVM calculations were used, one based on boaters' willingness to pay additional dollars for an Upper Klamath trip, and the other on their willingness to drive additional miles to the upper Klamath. Respondents were asked if they would still be willing to visit the upper Klamath if they move a specified distance away, and (b) if their share of the expenses were to increase by a specified dollar amount. Distance offers ranged from 10 to 1000 additional miles while dollar offers ranged from \$5 to \$1000.

Persons who answered "no" to either offer were asked their reason for doing so. For the willingness-to-pay question, the most frequent response (61 percent) was "The Upper Klamath is worth that much more, but I couldn't afford to spend that much more on a boat trip". For willingness to travel, the most frequent response (51 percent) was "It isn't worth it to me to travel that much farther". Those who responded that they did not understand the question (31.7% were not included in the analysis.)

Using this information, estimated logit equations were developed for both measures. Protest responses, missing values, and commercial guides were not considered in the analysis. The best-fitting equations are shown in Table 15. The consumer surplus estimates of \$187 and 651 miles are consistent when travel cost is 29 cents per mile. This is a realistic estimate of the total direct cost of vacation travel. Federal guidelines suggest that the average direct transportation cost (the average cost per mile of maintenance, parts, tires, accessories, gasoline, oil, and taxes) is approximately 12 cents per mile (Walsh, 1986). If the opportunity cost of time is set at one-third of the average reported wage rate of \$24.95 per hour (assuming 1,920 hours worked per year), and the average driving speed is 50 mph, the average opportunity cost per mile is 17 cents. Thus, the total direct cost of travel would be 29 cents per mile.

Table 15. Value Estimates Based on Contingent-Value Calculations

Equation (1): Willingness to pay additional dollars

$$\text{Prob(no)} = 1/1 + e(a + b \times 1)$$

XI	Coeff.	Prob.	
Constant	3.5713	0.0000	
Value	0.0093	0.0000	N = 316
Sex	0.8277	0.0021	
Inc	-0.0407	0.0768	WTP (\$) = \$187
Vac	0.7760	0.0068	

where Value = the dollar offer
 Sex = 1 if female
 Inc = income
 and Vac = single destination visit.

Equation (2): Willingness to drive additional miles

$$\text{Prob(no)} = 1/1 + e(a + b \times 1) \quad (2)$$

XI	Coeff.	Prob.	
Constant	-4.0057	0.0000	N = 316
Far	0.0030	0.0000	
Sex	0.6206	0.0368	WTP = 651 miles
Vac	0.5569	0.0728	

where Value = the additional mile offer.

In equation (2) of Table 15, income does not appear as an independent variable as it does in equation (1). When the willingness-to-travel model was fitted with income included, the sign of the income coefficient was positive and not significant. This result was opposite from equation (1) and has interesting implications.

Economic theory suggests that individuals will be constrained by both their income and their time. The extent to which a boater is constrained by either variable is determined to some extent by income. The higher one's income, the less likely one is to be constrained by income and the higher the opportunity cost of time. These results are consistent with this theory. Equation (1) suggests that depending on their incomes, paying additional dollars is a significant constraint for Upper Klamath users. However, the sign on the income variable in the willingness to drive additional miles equation (not reported) indicates that those with relatively high income will be less likely to travel additional miles (presumably due to the time constraint).

Substitutability. Respondents were asked to imagine that they had planned an Upper Klamath trip, but discovered that the turbines wouldn't be operating on the day they'd planned to go. Fifty-seven percent said they would choose a different activity, while 43 percent would find a different river. About 74 percent would expect to share the substitute experience with the same companions as would have gone on the Klamath trip. Most boaters (75 percent) would try to reschedule the Klamath trip during the same season.

For those who would boat another river, 61 percent said they would not expect the substitute trip to offer as much satisfaction or benefit as an Upper Klamath trip. By far the most likely substitute river was the Rogue (including the day-use section below Grants Pass), which was mentioned by 50 percent of respondents. The next most frequently mentioned rivers were the California Salmon (12 percent), American (11 percent), Lower Klamath (9 percent), Tuolumne (5 percent) and North Umpqua (5 percent). The rivers considered most similar to the Upper Klamath were the Rogue (mentioned by 9 percent), American (8 percent), California Salmon (7 percent) and Tuolumne (5 percent). In contrast, 18 percent said the river is unique.

For those who would choose another activity, only 25 percent said they would expect to get as much satisfaction as from a raft trip. The most popular substitute activity was hiking (chosen by 26 percent), followed by bicycling (13 percent), fishing (12 percent), sightseeing (9 percent), and attending the Ashland Shakespeare festival (7 percent). Visitor characteristics. An unusually high percentage of Upper Klamath respondents were women (46 percent). Boating experience levels were quite low, averaging four years overall and just one year on the Klamath. Only 49 percent of Klamath respondents were married at the time they made their trip. Other demographic variables were typical: an average age of 36; a mean family income of \$47,900; and high education levels, with 64 percent hold a bachelor's or advanced degree. The population is largely urban, with only 15 percent living in places of 5,000 people or less, while 45 percent live in cities or their suburbs. Upper Klamath boaters come from a wide geographical area, including several nations in Europe, but most live in California (48 percent) or Oregon (38 percent).

Boaters were asked to rate 12 likely reasons for visiting the Upper Klamath on a five-point scale (1=not important, 5=extremely important). the highest-rated reasons were "good rapids" (with a mean score of 4.5), "being in a natural setting" (4.3), "being with family/friends" (3.7) and "peace and solitude" (3.7). The least important reasons were "couldn't get permit on another river" (1.4), "good fishing" (1.5) and "meeting other boaters at the river" (1.7).

ESTIMATING MONETARY VALUES FOR USE PERMITS ON WESTERN RIVERS

Bo Shelby

ABSTRACT—Allocation of public resources requires information about values, but nonmarket commodities such as recreation do not have convenient monetary indicators. In an effort to establish monetary values, recreation economists have developed two major approaches to nonmarket valuation, both of which have drawbacks. The study described here uses sales of outfitting businesses to estimate the value of river running permits. Information from four western rivers suggests that access rights have considerable monetary value, and that values are highest on rivers where available permits are most fully used.

Setting priorities and allocating scarce resources requires information about the relative values of the commodities in question. A market economy supplies such information in terms of the prices and quantities of goods and services. Nonmarket commodities such as recreation, however, do not have such convenient indicators, and determining value is more difficult. Although monetary value is not the only consideration, information about it can be extremely helpful.

Recreation economists have developed two major methods for indirectly valuating nonmarket resources, both of which have shortcomings (Bishop and Heberlein 1979). The **travel cost** method uses trip expenditures as an approximation of willingness to pay admission costs. Potential sources of bias include differences in tastes and preferences, the availability of substitutes, establishing values for time costs, assuming that the aggregation of travel expenditures is perceived by visitors as the admission cost, assuming that the quality of recreation is constant regardless of variables such as amount of use, and the problem of assigning fractions of costs for multi-purpose trips. In addition, travel cost techniques are not applicable to activities involving limited travel.

Hypothetical valuation creates an imaginary situation in order to assess willingness to pay. The major problem here is that users have some incentive to misrepresent their views. They may overstate values if they think that supply might be increased but they would not have to pay a fee; or they may understate values if they believe that their answers will be used as a basis for increases in fees they would have to pay. Researchers never know which strategy, if any, respondents are using. In addition, hypothetical situations may not reflect behavior in an actual market situation. Considerable evidence from social psychology suggests it is wrong to assume that what people say is what they would actually do.

There are conflicting views about the merits of these approaches and the seriousness of their shortcomings (see, for example, Dwyer and Bowes 1979; Dyer and Hof 1979; or the discussion of "Estimating Recreation Benefits" in the January 1980 *Journal of Forestry*). There is general agreement, however, that estimates of monetary values are extremely useful, and every available means should be used to arrive at the best figures possible. For example, Bishop and Heberlein (1979) created an experimental market for a nonmarket resource by making cash offers for free geese hunting permits in Wisconsin. A sample of hunters received checks ranging from \$1 to \$200 with instructions to either return the check or mail in the permit. The average selling price was \$63 per permit, so access rights for all early goose hunting in Horicon Marsh in 1978 were worth approximately \$800,000. Creative strategies such as this make it possible to establish market values for nonmarket commodities.

Establishing Values for River Access

Whitewater recreation increased rapidly on many western rivers in the late 1960s and early 1970s. In a number of areas, managing agencies began limiting use to protect both the resource and the quality of experiences. The supply of recreation opportunities was thus limited by carrying capacities while demand continued to increase. With restricted access and growing demand, access rights became valuable.

Managing agencies developed allocation systems to distribute use permits. These systems were generally designed in recognition of the three major components needed to run rivers: equipment, skills, and access to a

river. The two major user groups differ on the first two components. Nonoutfitted users possess or have access to the necessary equipment and skills, while unskilled users rely on commercial outfitters. In recognition of these differences, the procedures for gaining access vary.

In the private or nonoutfitted sector, access rights are granted in small blocks—usually to a trip leader, but sometimes directly to trip participants (when they are listed on the permit). This agency-to-user transaction is relatively direct and involves no market. In times of high demand, agencies rely on a number of nonmarket mechanisms. These include first come-first served, reservations, lotteries, and waiting lists.

In the case of commercial river running, access rights are granted in larger blocks to outfitters. Most agencies developed allocation systems at a time when demand for river access did not greatly exceed supply, so most policies are based on the explicit contention that allocations (in terms of launches, passenger days, etc.) are not a salable commodity (Interagency Whitewater Committee 1976). In most cases, a market mechanism is not used for the agency-to-outfitter transaction. However, the market is free to operate in the outfitter-to-user transaction, in which an economically rational outfitter charges a market clearing price high enough to avoid having more customers than the permit allows. In a high-demand situation, this would result in a profit equal to the difference between the market price for selling access to users and the nominal nonmarket fee paid to the agency for a permit.

It is difficult to isolate the market value of the use permit, because outfitters sell their services to users at the same time they sell access. However, recent sales of outfitting business on several rivers provide information about the value of commercial use allocations. When an outfitter wants to sell his business, he finds a buyer who requires real property (boats, equipment, etc.)—and the right to operate on a river. Selling the real property is no problem, but the seller is not allowed to transfer his permit, so it is relinquished to the agency with the agreement that the permit will be reissued to the buyer. The buyer then pays the seller for the real property and the value of the permit. The agency's refusal to officially recognize the permit sale causes all parties to pretend that only the business is being sold, resulting in a quasi-market or black-market sale of the permit. The buyer intends to recover the price of the permit by selling access to customers (along with outfitting services).

To determine permit values, in the spring of 1979, I contacted agencies managing four popular western rivers. On each river an outfitting business had recently been sold, and I learned the selling price for the entire business and the approximate value of the real property listed on the bill of sale. Subtracting the real property figure from the selling price resulted in estimates of permit prices listed in the left-hand column of Table 1.

Because permits grant access rights for various amounts of use, these values needed to be standardized. Accordingly, prices were divided by the number of passenger-days (one passenger on the river for part or all of one day) represented by the permit. In the case of the Colorado River in the Grand Canyon, the permit specified a maximum of 10,000 passenger-days per year. For the other rivers, permits were issued for a specified number of trip launches, so passenger-day equivalents were derived by multiplying the average number of passengers per trip times the average trip length. Value per passenger-day is the permit price divided by the number of passenger-days, (one passenger on the river for part or all of one day) represented by the permit. In the case of the Colorado River in the Grand Canyon, the permit specified a maximum of 10,000 passenger-days per year. For the other rivers, permits were issued for a specified number of trip launches, so passenger-day equivalents were derived by multiplying the average number of passengers per trip times the average trip length. Value per passenger-day is the permit price divided by the number of passenger-days, amortized over five years at 10-percent interest. (The Park Service at Grand Canyon selected five years as the duration for concession permits, based on a study of outfitting businesses and their amortization patterns.) For sales occurring prior to 1979, values were adjusted to 1979 prices.

Values for access rights ranged from \$3.74 per passenger-day for the 1977 sale on the Snake River, to \$14.71 on the Colorado River in the Grand Canyon. Several factors suggest that these estimates are reasonably accurate. First, the value for each river was determined independently, but the values from one river to another are within a fairly small (\$11) range. Second, permit value on the Snake River increased from \$3.74 to \$6.24 between 1977 and 1979 (with the 1977 value adjusted for inflation). This rise in value was apparently caused by increased demand; the portion of available commercial launches that was actually used increased from 40 percent to 57

percent during this two-year period. Similarly, variation in values from one river to another generally follows the demand indicated by the amount that commercial allocations are used. Values are highest on the Colorado in Grand Canyon, where outfitters use virtually all of the passenger-days allotted to them. Finally, these values are close to the passenger-day values estimated from financial records of outfitting businesses in Grand Canyon National Park (C.R. Michael Parent, personal communication).

These findings suggest that access rights on whitewater rivers are worth a great deal. The figures in the far right column of Table 1 give total yearly values, derived by multiplying the single-day values by the total number of commercial and private user-days for the 1980 season. Just the access rights controlled by managing agencies—not outfitting businesses, not equipment sales, not tourism dollars spent in local communities—are annually worth over \$100,000 on the Snake, \$270,000 on the Rogue, \$458,000 on the Middle Fork, and \$1.5 million on the Colorado. Demand for these resources has apparently continued to increase since 1979; the value of access rights is probably greater now.

Who Should Control Access Rights?

Managing agencies originally intended to distribute river access rights to the public at no charge. This was to be done in a fair and efficient manner, without undue damage to the resource. However, allotting blocks of the scarce commodity (user-days) to either commercial outfitters or private trip leaders apparently defeats these original intentions, since the method allows someone outside the agency to reallocate user-days to individual users. The allocation system thus essentially allows individuals, particularly outfitters, to acquire and control access rights to public resources and then sell those rights back to the public.

The notion that allocations have no economic value is simply untrue; that fallacy should be replaced with the frank recognition that access rights to rivers are valuable. But this raises a number of difficult questions: Who should capture the value of a public resource? Should access rights be given away? Should agencies sell access in the same way that they sell other valuable resources such as timber? Should agencies give or sell access to entrepreneurs, who in turn re-sell to users?

Table 1. Estimated Values of Commercial River-Running Permits.

River	Estimated price of permit		Allocation (passenger-days per year)	Value per passenger-day ¹	Percent of commercial allocation used in 1978		Total yearly value
					Launches	User-days	
Colorado (Grand Canyon)	\$500,000	(1978)	10,000	\$14.71	—	99	\$11,525,089
Middle Fork Salmon (Idaho)	\$19,000	(1977)	518	\$11.61	83	55	\$458,096
Rogue (Oregon)	\$1,250	(1978)	52	\$ 7.07	73 ²	66 ²	\$270,668
Snake (Hells Canyon)	\$10,000	(1977)	845	\$ 3.74	40 ³	—	\$65,121
	\$20,000	(1979)	845	\$ 6.24	57	30	\$108,651

¹Assumes five-year amortization at 10-percent interest, adjusted to 1979 prices.

²These are 1977 figures; 1978 permit system used a common pool which made it noncomparable with systems on the other rivers.

³This is for the 1976 season, on which the sale was based.

The process of allocating recreation resources needs to be treated with the same care and scrutiny as timber sales, mineral leases, or other dispositions of valuable public resources.

Literature Cited

Bishop, R.C., and T.A. Heberlein. 1979. Measuring values of extramarket goods: are indirect measures biased? *Am. J. Agric. Econ.* 61(5):926-930.

Dwyer, J.F., and M.D. Bowes. 1979. Benefit-cost analysis for appraisal of recreation alternatives. *J. For.* 77:145-147.

Dyer, A.A., and J.G. Hof. 1979. Comment on "benefit-cost analysis for appraisal of recreation alternatives." J. For. 77:147.

Interagency Whitewater Committee. 1976. Interagency whitewater management guidelines.

Journal of Forestry. 1980. 78:21-28.

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U.S. Department of Agriculture 1989. *Draft 1990 RPA Program*. U.S. Forest Service, Washington, D.C.

This publication "is a long-term strategic planning document that provides direction for Forest Service programs." Appendix F of the document, "Resource Pricing and Valuation Guidelines for the 1990 RPA Program," is of interest to those persons wishing to assign economic values to natural resources available on public lands. The following three tables are a brief summary of the values estimated. Refer to the original document for a complete description of assumptions made and methods used. Forest Service Regions 5 and 6 are shown to acknowledge varying resource values in Oregon and California.

Fair Market Rental Value, and Fair Market Rental Value plus Consumer Surplus for Range Forage for the 1990 RPA Program, 1987 Constant Dollars.

	Fair Market Rental Value ¹		Fair Market Rental Value + CS ²	
	1987	2040	1987	2040
	<hr/> \$/AUM <hr/>			
Region 5:	4.53	5.63	5.63	6.96
Region 6:	4.36	5.42	5.17	6.40

¹ "Appraised fair market rental values for NFS lands in Regions 1-6 are based on a 1983 market value appraisal by the Forest Service and Bureau of Land Management."

² "These prices reflect the marginal value of National Forest Forage to the grazing permittee. Prices were derived through use of livestock enterprise budgets, by national forest by Region."

Market Clearing Prices for Water for the 1990 RPA Program, 1987 Constant Dollars.

	Irrigation	Price estimates by water use, 1985 ¹			Weighted Avg.	
		Municipal	Industrial	Thermoelectric	1987	2040
		<hr/> \$/acre foot <hr/>				
Region 5:	53	149	145	124	69.23	76.99
Region 6:	46	85	65	109	53.40	56.35

¹ "Water prices were developed from three main sources of information. An extensive review of recent professional literature, ... proprietary data bases of the consultants...merged with the *Water Market Update* database... This produced a total of over 900 market purchases and leases of water rights in the Western United States. Finally, water resource managers in both the public and private sectors were consulted about raw water values."

Market-Clearing and MCP + CS Prices for Recreation Used in the 1990 RPA Program and Prices for Wildlife and Fisheries Activity Outputs. 1987 Constant Dollars.

	Market-clearing price ¹				Market-clearing + CS ²			
	Activity-day ³		RVD ⁴		Activity-day		RVD	
	1987	2040	1987	2040	1987	2040	1987	2040
Camping, Picnicking and Swimming								
Region 5	4.19	4.36	7.97	8.29	7.68	7.99	14.35	14.92
Region 6	4.13	4.30	6.36	6.61	7.16	7.45	10.92	11.36
Mechanized Travel and Viewing Scenery								
Region 5	1.48	1.63	8.14	8.95	2.81	3.09	15.11	16.62
Region 6	2.13	2.34	8.08	8.89	3.69	4.06	13.82	15.20
Hiking, Horseback Riding and Water Travel								
Region 5	3.22	3.77	1.73	12.55	6.00	7.02	19.56	22.89
Region 6	3.00	3.57	9.80	11.47	5.56	6.57	17.84	20.87
Winter Sports								
Region 5	17.10	17.78	39.33	40.90	31.09	32.33	71.51	74.37
Region 6	17.10	17.78	39.33	40.90	31.09	32.33	71.51	74.37
Resorts ⁵								
Region 5	14.71	14.71	16.18	16.18	19.61	19.61	21.57	21.57
Region 6	14.71	14.71	16.18	16.18	19.61	19.61	21.57	21.57
All Other Recreation Activities (except wildlife and fish) ⁶								
Region 5	10.83	12.35	51.97	59.25	12.03	13.71	57.74	65.82
Region 6	8.63	9.84	41.43	47.23	9.59	10.93	46.03	52.47
Wilderness								
Region 5	11.49	13.56	12.98	15.32	26.00	30.68	29.38	29.38
Region 6	17.10	18.07	19.32	22.80	33.09	39.05	37.39	44.12
Hunting								
Region 5	18.11	19.86	30.60	33.58	32.92	36.54	55.64	61.76
Region 6	19.83	21.76	32.60	35.78	36.06	40.03	59.28	65.80
Fishing								
Region 5	21.20	24.08	58.42	66.35	38.54	44.71	106.22	123.22
Region 6	25.33	28.77	70.83	80.44	46.06	53.46	128.78	149.38
Nonconsumptive Wildlife Uses ⁷								
Region 5	18.00	20.95	67.04	78.02	32.79	38.69	121.90	143.84
Region 6	13.23	15.40	35.79	41.65	24.05	28.38	65.07	76.78

¹Market-clearing price. ²(R)esults from the intersection of the regional supply and demand curves, where those curves represent the sum of non-federal, other federal, and national forest outputs.

³Market-clearing price plus consumer surplus. ⁴Consumer surplus is the amount above actual price that a buyer would pay rather than go without the good.

⁵Activity-day. ⁶(R)epresents...the average amount of time spent during 24 hours pursuing that activity. The duration of an activity day varies depending on the activity. For example, the average length of a picnic is 3 hours on a single day. So an activity day of picnicking represents 3 person-hours of use.

⁷Recreation Visitor Day (RVD). ⁸...12 person-hours of a given activity. The primary advantage of an RVD is in comparing different activities because the total use for each activity is aggregated into standard 12-hour time units.

⁹Resorts. Value assigned to recreation occurring at resorts. ¹⁰... (R)esort sites on public lands are priced net of any capital investments.

¹¹All Other Recreation Activities. ¹²(A)ctivities in this group are team sports and gathering forest products, such as nuts and berries.

¹³Nonconsumptive Wildlife Uses. ¹⁴The definition...is based on the definition of Primary Nonresidential Nonconsumptive Use used in the 1980 National Survey of Fishing, Hunting and Wildlife Associated Recreation (U.S. Fish and Wildlife Service, 1983). This is defined as "trips and outings of at least 1 mile from home for the primary purpose of observing, photographing, or feeding wildlife."

U.S. Dept. of Energy. 1989. *Draft 1990 Resource Program: Technical Report*. Bonneville Power Administration, Portland, Oregon.

This draft report published in December 1989 summarizes resource actions proposed to meet future loads placed on Bonneville Power Administration (BPA). BPA analyzed a variety of methods that would increase available electrical energy. After including a 10% cost advantage to conservation resources, as required by law, the "resource stack" based on year 2000 real levelized costs, displayed in the following table, was developed. BPA suggests that real levelized costs can be compared to nominal levelized costs "by multiplying them by the following factors, which depend on the resources lifetime. For resources with 20-, 30-, 40-, or 50- year lives multiplying "real" levelized costs by 1.6, 1.8, 2.0 or 2.2, respectively to convert to "nominal" levelized costs."

BPA'S Resource Stack

Resource	Levelized Cost ^a mills per kWh (1988 \$)	BPA Supply 1992-2010 (aMW) Med Loads	BPA Supply 1992-2010 (aMW) High Loads
Hydro Efficiency Improvements	13	112	112
Conservation:			
Refrigerators ^b	13	34	43
Freezers ^b	16	12	16
Industrial	16	120	191
Irrigation	16	14	14
New Commercial Lost Opportunities	18	65	122
Water Heat ^b	19	114	152
New Commercial Discretionary	22	44	85
Small Hydro 1	20	23	23
Conservation:			
New Manufactured Housing	24	45	47
Existing Commercial Lost Opportunities	28	72	72
Existing Commercial Discretionary	30	86	86
New Multifamily Residential (MCS)	30	11	12
Existing Multifamily Residential	31	12	12
Existing Single-Family Residential	33	62	62
New Single-Family Residential (MCS)	33	55	148
Cogeneration 1	30	31	31
CT's and Displaceable Purchases	26-34	1,500	1,500
Small Hydro 2	34	26	26
Cogeneration 2	35	125	125
BPA Trans Efficiency Improvements	36	34	34
WNP-1 and -3	34	1,619	1,619
Cogeneration 3	40	250	250
BC Hydro Imports	40	500	500
Coal	40	5,000	5,000

^aYear 2000 real levelized cost in 1988 mills/kWh. Levelized costs for generation resources assume 50 percent public and 50 percent private financing. Levelized costs for conservation resources assume 100 percent debt financing at a 9.2 percent nominal interest rate.

^bAchievable MW's are for 1995-2010.

U.S. Dept. of Energy. 1989. Draft Environmental Impact Statement Salt Caves Hydroelectric Project (FERC 10199-000). Federal Energy Regulatory Commission, Washington, D.C.

Designation of the Upper Klamath River between the J.C. Boyle dam and the slackwater of Copco Dam would precluded development of any hydroelectric project that degrade the resources for which the river was designated. Salt Caves Hydroelectric Project is the only project currently pending in the area and may be considered representative of the type of project that could be developed in this reach. The Salt Caves Draft Environmental Impact Statement examines the impacts associated with three possible configurations of the Salt Caves Project. The Final Salt Caves Hydroelectric Project EIS could differ from the Draft EIS; therefore, it should be considered the most definitive FERC analysis of effects of hydroelectric development. Economic estimates given in the Draft Salt Caves Hydroelectric Project EIS are summarized here only as a convenience. The Final Salt Caves Hydroelectric Project EIS will be printed in May 1990.

CONSTRUCTION PHASE

Applicants Proposal

During the estimated 37 month construction schedule, employment would peak at 350. Approximately 60 percent, or 210 workers would be hired locally. The remaining labor needs would be met by in-migrating workers. An estimated population increase of less than 1 percent is anticipated due to in-migrating workers and their families.

Construction wages over the three year construction period would be approximately \$22 million. Spending for construction supply and equipment is estimated to be \$14.5 million. "The \$22 million in new construction wages ... would add approximately \$1 million of additional income tax revenue to the state. In addition, should any in-migrating workers build new homes in the project area, they would increase local property tax revenues by \$24.10 per \$1,000 of assessed value." (pg.4-70).

All anticipated housing, education, fire protection and transportation needs can be met under this proposed development.

Applicant Proposal w/Mitigation

"Peak project employment would increase by 36 percent over the applicant's proposal resulting in a slightly greater increase in population and income." (pg.4-97)

All anticipated housing, education, fire protection and transportation needs would be met.

No Dam Alternative

During construction employment would peak at 539 workers. "The population increase associated with this employment level would result in slightly less than 21 percent increase, or 400 persons." (pg. 4-123)

Wages and local expenditures for construction equipment and supplies would be as high as 37.5 million. Tax revenues to the state would be approximately \$1 million during construction.

All anticipated housing, education, fire protection and transportation needs would be met under the proposed No-Dam Alternative.

OPERATION PHASE

Applicant's Proposal

The applicant submits that economic effects of operation would include increases in local government revenues, future economic development, decreasing taxes and impacts associated with the change in whitewater rafting patterns on the river.

The City of Klamath Falls has forecast net revenues from operation of the Salt Caves project.

Projected annual revenues, assuring prices equal to the level cost of long-term marginal electrical generation (coal-fired plants) could reach \$12.1 million.

Based on the average of levelized project costs and the levelized costs of coal-fired generation, revenues are expected to exceed costs by \$6.9 million annually, until all debt is retired (30 years, and \$28.0 million thereafter).

If the 6.9 million annual revenue is spent as intended by the City of Klamath falls, \$5.8 million would relieve local government operating cost deficits and support local economic development. The remaining 1.1 would accrue to property owners as a property tax offset. Property taxes for city residents would be reduced from \$24.10 per \$1,000 to \$21.30 per \$1,000.

Proposal with Mitigation

Operational changes due to increased project costs and reduced electrical energy output associated with recommended mitigation would reduce local net revenues from the applicant's proposal by 45 percent.

No-Dam Alternative

Operation of the project could generate \$6.8 million annually until debt is retired (30 years), and \$29.8 million thereafter. Impacts to local government revenues, future economic development and taxes would be similar to the applicant's original proposal.

WHITEWATER RAFTING

Applicant's Proposal

Based on an assumed \$110 per rafter day, commercial guide service income could be reduced by as much as \$165,000 per year. These adverse economic impacts would be felt outside Klamath County since no commercial rafting companies are based in the county and most rafters using guide services do not buy provisions or stay overnight in Klamath County.

With Mitigation

"A portion of the current rafting season would be lost, and the length of the raftable reach reduced. "No assessment of commercial guide income is mentioned.

No-Dam Alternative

"Whitewater boating use under this alternative could reasonably reach existing levels of 3,000 users, which would mean no loss in income to commercial guide services."

Discussion of Levelized Costs

"The cost of each alternative was compared to the cost of the region's long-term marginal generating resource (coal-fired powerplant) as defined by the (Northwest Power Planning) Council."

Table 2-5 from the FERC Draft Salt Caves EIS (excerpted here) shows conclusions reached by FERC regarding nominal levelized cost of electric power generation of each Salt Caves configuration. Net economic benefit is the savings made by selecting hydro generation instead of coal-generation. Levelized costs are compared assuming a "stand alone" project. How a project would interact with current generation facilities in the region is not examined.

Table 2-5. Levelized cost comparison to the long-term marginal resource, (1995 dollars)¹

Hydroelectric Project	Levelized Cost (mills/kWh)	Coal-Fired Alternative Cost (mills/kWh)	Levelized Net Economic Benefit (mills/kWh)
Salt caves Project (Applicant's Proposal)	58	95	37
Salt Caves Project (Recommended Mitigation)	73	95	22
No-dam Alternative	65	95	30

¹Source: the staff.

U.S. Dept. of the Interior. 1989. *1985 National Survey of Fishing, Hunting and Wildlife-Associated Recreation*.
U.S. Fish and Wildlife Service, Washington, D.C. Oregon Summary

A comprehensive summary of an extensive national survey conducted by the U.S. Bureau of Census for the U.S. Fish and Wildlife Service. "In the State of Oregon, 1880 households were screened for participants by telephone. There were 634 completed (in-person) interviews with fishermen and hunters and 588 completed interviews with nonconsumptive participants in Oregon."

The following three tables summarize recreation participation and expenditures in Oregon and California. This data is not county specific.

Brief definitions of terms used by the survey are included here. More complete definitions are contained in the original document.

Nonconsumptive Activities: Non-harvesting wildlife-associated recreation such as feeding, observing or photographing fish and other wildlife. In this survey, hunters and fishermen may also be participants in nonconsumptive activities.

Primary Participants: Trips or activities whose primary purpose is to observe, feed or photograph fish and wildlife.

Secondary Participants: Persons who enjoy seeing or hearing wildlife while participating in outings or activities for another purpose.

Residential: Activities around the home or within one mile of home.

Non-residential: Activities and outings of at least one mile from home. Trips to zoos, circuses, aquariums and museums are not considered nonconsumptive wildlife activities in this survey.

Fishermen and Hunters, by Sportsman's State of Residence. California and Oregon, 1985

(U.S. Population 16 years old and older) (thousands)

	OREGON		CALIFORNIA	
	Number	Percentage	Number	Percentage
Population	2,015	-	10,180	-
Fished or Hunted	745	37	4,130	20
Fished Only	438	22	3,454	17
Hunted Only	55	3	146	1
Fished and Hunted	251	12	530	3

Participants In Nonconsumptive Activities, by Participants State of Residence. California and Oregon, 1985

(U.S. population 16 years old or older) (thousands)

	CALIFORNIA		OREGON	
	Number	Percentage	Number	Percentage
Population	20,180	-	2,015	-
Total Nonconsumptive Participants	13,090	65	1,728	86
Primary Participants	-	-	-	-
Total	9,949	49	1,389	69
Non-residential	2,956	15	634	31
Residential	9,161	45	1,249	62
Secondary Participants	-	-	-	-
Total	12,432	62	1,654	82
Non-residential	9,627	48	1,282	64
Residential	11,375	56	1,502	75

Note: Detail does not add to total because of multiple responses.

Expenditures for Wildlife-Associated Recreation by Participant's State of Residence. Oregon and California, 1985

(U.S. Population 16 years old and older. Thousands of dollars)

	OREGON	CALIFORNIA
Total Wildlife-Associated Expenditures		
Total	\$805,181	\$5,541,554
Trip-related	360,279	2,299,748
Equipment	387,039	3,052,787
Other	57,863	189,021
Fishing and Hunting Expenditures		
Total	656,474	3,766,496
Trip-related	266,656	1,755,159
Equipment	339,417	1,887,120
Other ¹	50,401	124,218
Nonconsumptive Expenditures		
Total	148,707	1,775,058
Trip-related	96,623	544,589
Equipment	47,622	1,165,667
Other	7,462	64,803

¹ Includes expenditures for magazine subscriptions, membership dues and contributions, land leasing and ownership, and licenses, stamps, tags and permits.

Walsh, R.G., Saunders, and Loomis, *Wild and Scenic River Economics Recreation Use and Preservation Values* @ 1985 American Wilderness Alliance, Englewood, Colorado.

This document is a contingent valuation study of rivers in Colorado proposed for inclusion in the National River Systems. The rivers and values discussed in the document are specific to Colorado, however, the study makes a strong case for inclusion of non-use preservation values when determining the socially desirable number of rivers needing protection.

The study used a survey method to determine individual willingness to pay for river use and non-use preservation. Total non-use preservation values were measured by these subparts: option value, an annual payment that insures the option of possible future use; existence value, "willingness to pay for the knowledge that natural rivers are all protected as habitat for plants, fish and wildlife even through no recreation use is contemplated"; and bequest value, "the satisfaction derived from endowing future generations with rivers".

For a package of eleven rivers recommended for wild and scenic designation the survey found resident households were found to have a willingness to pay \$95 per year to protect the rivers.

Recreation use value was \$18, other non-use preservation values were as follows: option value, \$15; existence value, \$27; bequest value, \$34.

The authors found that total willingness to pay increased at a decreasing rate as more rivers were suggested for protection. The following table summarizes willingness-to-pay for protection of three, seven, eleven, and fifteen rivers. The table is reproduced here. Note: the population and dollar figures are for 1983.

Willingness to Pay Per Year for Recreation and Preservation Value of Wild and Scenic Rivers, Colorado, 1983.

Annual Recreation Use and Preservation Values	Potential Wild and Scenic Rivers			
	Three Most Valuable Rivers	Seven Most Valuable Rivers	Eleven Study Rivers	Fifteen Most Valuable Rivers ^b
	(Poudre, Elk, and Colorado)	(Add Gunnison, Green, Yampa, and Piedra)	(Add Los Pinos, Conejos, Dolores, and Encampment)	(Add Arkansas, Roaring Fork, South Platte, and Rio Grande)
Recreation Use Value				
Per Household	\$7.54	\$14.08	\$18.00	\$19.16
Total, Millions ^a	8.9	16.7	21.3	22.7
Preservation Value to Colorado Residents				
Per Household	32.26	60.24	77.00	81.96
Total, Millions	38.2	71.9	91.3	97.1
Option Value				
Per Household	6.28	11.73	15.00	15.97
Total, Millions	7.5	13.9	17.8	18.9
Existence Value				
Per Household	11.31	21.12	27.00	27.67
Total, Millions	13.4	25.0	32.0	32.8
Bequest Value				
Household	14.66	27.38	35.00	36.19
Total, Millions	17.4	32.5	41.5	42.9
Total Recreation Use Value and Preservation Value ^c to Colorado Households				
Per Household	39.80	74.32	95.00	101.12
Total, Millions	47.1	88.6	112.6	119.8

^aRecreation use and preservation values reported by the sample were multiplied by 1,185,000 households in Colorado. The U.S. Census reported Colorado population of 3,139,000 in 1983. Average number of persons per household was estimated at 2.65 based on the 1980 census.

^bEleven rivers have been studied and found qualified for designation. In addition, this study asked respondents if sections of other rivers should be studied for possible designation. The four rivers shown are among those rivers most respondents agreed should be studied. Since willingness to pay was not obtained for these specific rivers, the estimated values in this column are forecasts based on the function: $WTP = 4.67 + 13.03(Q) - 0.44(Q)^2$, where Q = number of rivers.

^cThe 95 percent confidence interval was equal to 26.6 percent + mean values.

Ward, John G. "Economic Assessment of the Klamath as a Wild and Scenic River." April 20, 1987. As appears in: City of Klamath Falls, *Application for License Salt Caves Hydroelectric Project: Analysis of Potential Economic Effects on the Klamath River Whitewater Rafting Industry*. October 1988.

This assessment attributed \$748,105 of direct expenditure to whitewater recreation, including guide schools, on the upper Klamath River. This included outfitter fees, equipment, food, lodging and travel expenses paid by visitors. A \$2.88 Amusement and Recreation Coefficient (adjusted for inflation from the 1976 coefficient of \$1.51) was used to determine a total economic contribution of \$2,154,530 by whitewater recreation on the Salt Caves segment of the Klamath river.

Similar assessments of visitor expenditures associated with trophy trout fishing and big and small game hunting were made. It was found that direct expenditures for fishing and hunting totaled \$125,600. When indirect and induced expenditures were included for these activities a total of \$418,720 was contributed to the regional economy.

In this assessment, no analysis was made to examine the impacts of Salt Caves hydroelectric development on revenues associated with recreation use of the upper Klamath River.

